auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163320
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV33084

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163321
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV33094

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163322
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV33104

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163323
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV33114

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163324
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV33124

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163325
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV33134

<400> 163325

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163326
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV33144

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163327
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV33154

<400> 163327
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163328
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACV33164

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163329
<211> 1701

<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<220>
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hemagglutinin__InfluenzaA__ACV41981

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163331
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACV41991

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163332
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACV42001

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163333
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV42008

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cagugcagaa ucugcaucug a 1701

<210> 163334
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACV42018

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163335
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACV49501

<400> 163335
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccga cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg uguuccagaa cgagaccugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caccgagggc 420

uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccggc 480

agcggcuucu ucagcagacu gaacuggcug accaagagcg gcagcaccua ccccgugcug 540

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cccagcacca accaggagca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccagaa gaagccagca gaccaucauc cccaacaucu ggagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

aacuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagag aggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163336
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<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccga cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg uguuccagaa cgagaccugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

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uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccggc 480

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aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccagcacca accaggagca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccagaa gaagccagca gaccaucauc cccaacaucg agagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaaggac 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagag aggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163337
<211> 1701
<212> RNA
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agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg uguuccagaa cgagaccugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caccgagggc 420

uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccggc 480

agcggcuucu ucagcagacu gaacuggcug accaagagcg gcagcaccua ccccgugcug 540

aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccagcacca accaggagca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccagaa gaagccagca gaccaucauc cccaacaucg agagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagag aggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163338
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<212> RNA
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gagcagcuuc 480

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uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163339
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV49556

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgacagccu gcugcccgcc agcagcugga gcuacaucgu ggagaccccc 300

aacagcaaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaagcaca gcaccaccaa gggcgugacc gccgccugca gccacgccgg caagagcagc 480

uucuacagaa accugcugug gcugaccaag aaggaggaca gcuaccccaa gcugagcaac 540

agcuacguga acaagaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

agcagcaagg agcagcagac ccuguaccag aacgagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu caucccccgag aucgccgaga gacccgaggu gaaggaccag 720

gccggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accuggguggc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcaugcac gagugcaaca ccaagugcca gaccccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcgc caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugaa gauccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac gagugcaugg agagcgugag aaacggcacc 1500

uacgacuacc ccaaguacag caaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163340
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACV49567

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gcugagcaag agaagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcgccug cuaccccggc gacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaagcaca acaucaccag aggcgugacc gccgccugca gccacgccgg caagagcagc 480

uucuacaaga accugcugug gcugaccgag accgacggca gcuaccccaa gcugagcaag 540

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aacaucgagg accagaagac ccuguacaga aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagaggccag 720

gccggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagaga cuucggcagc 840

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ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163341
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV49578

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gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

aaguacagcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

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cugguggccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

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accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

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acccaguucg aggccguggg caaggaguuc agcaaccugg agaagagacu ggagaaccug 1260

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cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcauggac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 163342
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV49589

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gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

aaguacagcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

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cugguggccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

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acccagaagg ccuucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agaagagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcauggac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 163343
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV49600

<400> 163343

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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

augguguggc ugaccgagaa gggcagcaac uaccccgugg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgagaccgag 600

cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca cccccgagau cgccaccaga cccaagguga acggccaggg cggcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 163344
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV49611

<400> 163344
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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

augguguggc ugaccgagaa gggcagcaac uaccccgugg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgagaccgag 600

cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca cccccaagau cgccaccaga cccaagguga acggccaggg cggcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

aacaagaagg uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 163345
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV49633

<400> 163345
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgugca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccccccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163346
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV49644

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccagcuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163347
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV49676

<400> 163347
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcaucaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163348
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV53450

<400> 163348
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163349
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV53460

<400> 163349
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163350
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV53480

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163351
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV53490

<400> 163351
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaccaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163352
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV53500

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaccaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163353
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV53880

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163354
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACV53881

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163355
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV53882

<400> 163355
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163356
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV53883

<400> 163356
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163357
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV53885

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163358
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV53899

<400> 163358
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163359
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV53909

<400> 163359
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163360
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67220

<400> 163360
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163361
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67221

<400> 163361

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcggcagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag agcgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163362
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67222

<400> 163362
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163363
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67223

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163364
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67224

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163365
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67225

<400> 163365
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163366
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67226

<400> 163366
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163367
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67227

<400> 163367
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcaacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163368
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67228

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163369
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV67229

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163370
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67230

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163371
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67231

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163372
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACV67232

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163373
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67233

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163374
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67234

<400> 163374
auggaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163375
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67235

<400> 163375
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaacgagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163376
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67236

<400> 163376
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gagugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163377
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACV67238

<400> 163377
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163378
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67239

<400> 163378
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcaacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163379
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67240

<400> 163379

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gagugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163380
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67241

<400> 163380
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aacggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163381
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67242

<400> 163381
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163382
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67244

<400> 163382
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163383
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67246

<400> 163383
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163384
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV67247

<400> 163384
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163385
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70073

<400> 163385
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163386
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70093

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163387
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70103

<400> 163387
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163388
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70113

<400> 163388
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163389
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70123

<400> 163389
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163390
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACV70154

<400> 163390
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163391
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70164

<400> 163391
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccugaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163392
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70174

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163393
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70184

<400> 163393
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163394
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70194

<400> 163394
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163395
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70204

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163396
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70214

<400> 163396
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163397
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70224

<400> 163397

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163398
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163399
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70254

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163400
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70264

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163401
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70274

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163402
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70284

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163403
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70294

<400> 163403
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163404
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70304

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163405
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70314

<400> 163405
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccugaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163406
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70324

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163407
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70334

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163408
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACV70344

<400> 163408
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163409
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70354

<400> 163409
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163410
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70364

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163411
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70374

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163412
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70384

<400> 163412
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163413
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<212> RNA
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hemagglutinin__InfluenzaA__ACV70394

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__ACV70404

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__ACV70414

<400> 163415

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163416
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163417
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACV70434

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163418
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACV70444

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163419
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACV70454

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163420
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70464

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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<210> 163426
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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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hemagglutinin__InfluenzaA__ACV70534

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163428
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70544

<400> 163428
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163429
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70564

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163430
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70584

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163431
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACV70594

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccugaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163432
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70604

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163433
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70614

<400> 163433

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163434
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70624

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163435
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70634

<400> 163435
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163436
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70644

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163437
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70654

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163438
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70664

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163439
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70674

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163440
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70684

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163441
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70694

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163442
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70704

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163443
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70714

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163444
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACV70724

<400> 163444
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163445
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70734

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163446
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70744

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163447
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70754

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163448
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70764

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163449
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70784

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163450
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70794

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgccacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163451
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70804

<400> 163451

augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163452
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70824

<400> 163452
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccugaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163453
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70834

<400> 163453
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163454
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70844

<400> 163454
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163455
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70854

<400> 163455
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163456
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70864

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcacca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163457
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70874

<400> 163457
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163458
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70884

<400> 163458
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163459
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70904

<400> 163459
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163460
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70914

<400> 163460
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163461
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70924

<400> 163461
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163462
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACV70934

<400> 163462
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163463
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70944

<400> 163463
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163464
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70954

<400> 163464
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163465
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70964

<400> 163465
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163466
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV70974

<400> 163466
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163467
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70984

<400> 163467
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163468
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV70994

<400> 163468
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163469
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV71004

<400> 163469

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163470
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV82230

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag ccaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccaggcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163471
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV82232

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163472
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV82233

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaagaucag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163473
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV83662

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163474
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV83663

<400> 163474
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163475
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV83664

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163476
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV83665

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaucgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163477
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV83667

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163478
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV83668

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163479
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV83670

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163480
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACV83671

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163481
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV88399

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163482
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV88409

<400> 163482
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163483
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV88419

<400> 163483
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163484
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV89502

<400> 163484
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag gagggcagcu accccaagcu gaagaacagc 540

uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca ccccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

gccaucaaca gcagccugcc cuaccagaac auccaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

aucgacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

cuggagagca ugggcaucua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 163485
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACV89516

<400> 163485
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgacagccu gcugcccgcc agcagcugga gcuacaucgu ggagaccccc 300

aacagcaaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaagcaca gcaccaccaa gggcgugacc gccgccugca gccacgccgg caagagcagc 480

uucuacagaa accugcugug gcugaccaag aagggcgaca gcuaccccaa gcugagcaac 540

agcuacguga acaagaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

agcagcaagg agcagcagac ccuguaccag aacgagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu caucccccgag aucgccgaga gacccgaggu gaaggaccag 720

gccggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugguggc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcaugcac gagugcaaca ccaagugcca gaccccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcgc caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucaac ggcaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaacaaccu ggagaagaga 1260

auggagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugaa gauccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac gagugcaugg agagcgugag aaacggcacc 1500

uacgacuacc ccaaguacag caaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163486
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV90512

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgaguggccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca agaugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugacc 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 163487
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV91672

<400> 163487

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163488
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACV91676

<400> 163488
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163489
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACV91680

<400> 163489
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163490
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX31591

<400> 163490
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccaggcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163491
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX31933

<400> 163491
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163492
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX31934

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucaccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163493
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX31935

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163494
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX31936

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163495
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX31939

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163496
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX31940

<400> 163496
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163497
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX31943

<400> 163497
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163498
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 163498
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163499
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX31947

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163500
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX31948

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163501
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX31949

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac uacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg aggaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163502
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX31950

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163503
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX31951

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163504
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX31954

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163505
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX31955

<400> 163505

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163506
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX31956

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163507
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX31957

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163508
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX31958

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163509
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX31960

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163510
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACX31961

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163511
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX31962

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163512
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX31964

<400> 163512
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163513
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<220>
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hemagglutinin__InfluenzaA__ACX35237

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ACX35247

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ACX35257

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163516
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163517
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX35277

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163518
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACX35287

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 163519
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACX35297

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163520
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACX35307

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug gugggccccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACX36501

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag caucuaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163524
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag caucuaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163525
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACX36503

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag caucuaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163526
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACX47367

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug gugaagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163527
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__ACX47368

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163528
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACX47369

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163529
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACX47370

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg acagacagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163530
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACX47371

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163531
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ACX47372

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163532
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX47373

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163533
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACX47374

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163534
<211> 1701
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 163535
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACX47376

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163536
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX47377

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163537
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX47380

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucguga uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163538
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX47381

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucguga uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163539
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX47382

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucguga uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163540
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX47383

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163541
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX47384

<400> 163541

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163542
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACX47385

<400> 163542
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163543
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACX47387

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163544
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<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163545
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACX61574

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163546
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX61575

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163547
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX83577

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163548
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACX94091

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac caucagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163549
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACY26192

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163550
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACY26202

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163551
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACY46103

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163552
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACY46113

<400> 163552
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163553
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY46123

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gggcgaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163554
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46133

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163555
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46163

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163556
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46173

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163557
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46213

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163558
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46223

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163559
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46233

<400> 163559

augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163560
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46243

<400> 163560
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163561
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46253

<400> 163561
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163562
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46263

<400> 163562
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163563
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46273

<400> 163563
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163564
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46283

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163565
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46293

<400> 163565
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccgccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163566
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46303

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163567
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46313

<400> 163567
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163568
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY46323

<400> 163568
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163569
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY46343

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163570
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACY46353

<400> 163570
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163571
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46373

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163572
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46383

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163573
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46393

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163574
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46403

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163575
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY46413

<400> 163575
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163576
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46433

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163577
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY46443

<400> 163577

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163578
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACY46453

<400> 163578
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163579
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46463

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163580
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46473

<400> 163580
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163581
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46493

<400> 163581
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163582
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46513

<400> 163582
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga caacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163583
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY46523

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163584
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY46533

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163585
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY46562

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163586
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46572

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163587
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY46582

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 163588
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACY46592

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163589
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46622

<400> 163589
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163590
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46672

<400> 163590
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163591
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46682

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163592
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46692

<400> 163592
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163593
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACY46712

<400> 163593
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163594
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46722

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg gccagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163595
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46742

<400> 163595

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163596
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACY46762

<400> 163596
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163597
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACY46772

<400> 163597
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 163598
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hemagglutinin__InfluenzaA__ACY46903

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163599
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__ACY77534

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163600
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hemagglutinin__InfluenzaA__ACY77544

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac caccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcug gagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163601
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hemagglutinin__InfluenzaA__ACY77554

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcgg ccaccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163602
<211> 1695
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACY77573

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcgg ccacagcugc 1680

agaaucugca ucuga 1695

<210> 163603
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY77593

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 163604
<211> 1698
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACY77603

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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ugcagaaucu gcaucuga 1698

<210> 163605
<211> 1695
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACY77613

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcgg ccacagcugc 1680

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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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hemagglutinin__InfluenzaA__ACY77683

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcug gagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163610
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucaccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcug gagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163611
<211> 1698
<212> RNA
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<220>
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 163612
<211> 1698
<212> RNA
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hemagglutinin__InfluenzaA__ACY77713

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ACY77723

<400> 163613

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<212> RNA
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hemagglutinin__InfluenzaA__ACY77733

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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uucuacaaga accugaucug gcuggugaag accggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcgg ccugcagugc 1680

agaaucugca ucuga 1695

<210> 163615
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hemagglutinin__InfluenzaA__ACY77743

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcug gagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163616
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACY77753

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163617
<211> 1695

<212> RNA
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gugaccguga cccacagcgu gaaccugcug ggcgacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agaaucugca ucuga 1695

<210> 163618
<211> 1698
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACY77813

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 163619
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY77823

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 163620
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY77833

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcug gagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163621
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY77843

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac caccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcgg ccaccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163622
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY77863

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcgg caugagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163623
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY77874

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163624
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163625
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY77904

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaagcacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163626
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY77914

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163627
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACY77924

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163628
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACY77934

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccgagagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 163634
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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<212> RNA
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<210> 163636
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163637
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ05050

<400> 163637
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163638
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ05061

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccugaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163639
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ05071

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163640
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05081

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163641
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05091

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163642
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ05101

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163643
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05111

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163644
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ05121

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaca accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg gcagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163645
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05131

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163646
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05141

<400> 163646
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163647
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05151

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163648
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05172

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163649
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05194

<400> 163649

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 163650
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05205

<400> 163650
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163651
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05216

<400> 163651
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ggcaacgaca acaacaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163652
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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 163653
<211> 1701

<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 163654
<211> 1701
<212> RNA
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<220>
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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 163655
<211> 1701
<212> RNA
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<220>
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163656
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ05271

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 163657
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ05282

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 163658
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05304

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 163659
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ05315

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163660
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ05326

<400> 163660
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163661
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05337

<400> 163661
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaga 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucagcagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcuu caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163662
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05348

<400> 163662
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163663
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05359

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163664
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05370

<400> 163664
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163665
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ05392

<400> 163665
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc gccagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163666
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05403

<400> 163666
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163667
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05436

<400> 163667

augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagagcugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163668
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ05458

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163669
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05469

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163670
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ05480

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagagcugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163671
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05513

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163672
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ05524

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163673
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05535

<400> 163673
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163674
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05546

<400> 163674
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163675
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05557

<400> 163675
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163676
<211> 1698
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACZ05579

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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hemagglutinin__InfluenzaA__ACZ05590

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcgacc agaagacccu guaccacacc gaggacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 163678
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 163678
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163679
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ05961

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163680
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ05972

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

agccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163681
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05983

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaacac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 163682
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ05994

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugaccg ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163683
<211> 1701
<212> RNA
<213> Artificial Sequence

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 163684
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163685
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hemagglutinin__InfluenzaA__ACZ16013

<400> 163685

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaaggccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 163686
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<212> RNA
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hemagglutinin__InfluenzaA__ACZ16023

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163687
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<212> RNA
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hemagglutinin__InfluenzaA__ACZ16033

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgccagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacaagg agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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<210> 163688
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<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163689
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__ACZ16050

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163690
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACZ16060

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163691
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16070

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gagccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163692
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16080

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgacggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163693
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16090

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcaugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163694
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16100

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163695
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16110

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163696
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ16120

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163697
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16130

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163698
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16140

<400> 163698
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ACZ16170

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__ACZ16180

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guacaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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<210> 163705
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hemagglutinin__InfluenzaA__ACZ16210

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 163706
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hemagglutinin__InfluenzaA__ACZ16220

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163707
<211> 1701

<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<212> RNA
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hemagglutinin__InfluenzaA__ACZ16240

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ACZ16260

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163710
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACZ16270

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagaa ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163711
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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<210> 163712
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACZ16290

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 163713
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hemagglutinin__InfluenzaA__ACZ16300

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163714
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<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__ACZ16320

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ACZ16330

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163717
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hemagglutinin__InfluenzaA__ACZ16340

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163718
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16350

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163719
<211> 1701
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hemagglutinin__InfluenzaA__ACZ16360

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 163720
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<220>
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hemagglutinin__InfluenzaA__ACZ16370

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163721
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16380

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163722
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163723
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ACZ16400

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163724
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16410

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163725
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16420

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163726
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16430

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163727
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16440

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163728
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16450

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug gugaagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163729
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16460

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163730
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hemagglutinin__InfluenzaA__ACZ16470

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163733
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACZ16500

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163734
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACZ16510

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163735
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACZ16530

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cagugcagaa ucugcaucug a 1701

<210> 163736
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACZ16540

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163737
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ16550

<400> 163737
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163738
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16583

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163739
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16593

<400> 163739

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163740
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16603

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163741
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16630

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163742
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16640

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163743
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16650

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163744
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163745
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16670

<400> 163745
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163746
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16680

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163747
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16690

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163748
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16700

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163749
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16710

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163750
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ16720

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163751
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16730

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163752
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16740

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163753
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACZ16750

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163754
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16760

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163755
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACZ16770

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163756
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16780

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163757
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16790

<400> 163757

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163758
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163759
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16810

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163760
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16820

<400> 163760
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccugaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163761
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16830

<400> 163761
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163762
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16840

<400> 163762
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gaaccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163763
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16850

<400> 163763
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163764
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16860

<400> 163764
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugge ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163765
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16870

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163766
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16880

<400> 163766
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgacggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcaacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163767
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ16890

<400> 163767
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163768
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ16900

<400> 163768
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163769
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16910

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163770
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16920

<400> 163770
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163771
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ16930

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163772
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16940

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163773
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16950

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163774
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16960

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163775
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ16970

<400> 163775

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163776
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<220>
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hemagglutinin__InfluenzaA__ACZ16980

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163777
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<212> RNA
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hemagglutinin__InfluenzaA__ACZ17000

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163778
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACZ17010

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163779
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ17020

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163780
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ17030

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggaggccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163781
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17040

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 163782
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17050

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163783
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17060

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163784
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ17070

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163785
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ17080

<400> 163785
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163786
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 163786
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gugaccguga cccacagcgu gaaccugcug ggcgacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163787
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17100

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163788
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ17110

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccga gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163789
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17120

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163790
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17130

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163791
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ17140

<400> 163791
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163792
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17150

<400> 163792
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163793
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17160

<400> 163793

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163794
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ17170

<400> 163794
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163795
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17190

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcagca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163796
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17200

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcagca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163797
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17220

<400> 163797
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163798
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17230

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugaaggag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163799
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ17240

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163800
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ17250

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163801
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ17260

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163802
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ17270

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc agaugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163803
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ17290

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163804
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ17300

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 163805
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17310

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163806
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ17398

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163807
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163809
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163810
<211> 1701
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hemagglutinin__InfluenzaA__ACZ17448

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163811
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ17458

<400> 163811

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 163812
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 163813
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACZ17488

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163814
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACZ18240

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163815
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__ACZ27800

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaaggaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163817
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hemagglutinin__InfluenzaA__ACZ27810

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163818
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ27820

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163819
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACZ27830

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 163820
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACZ27840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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<210> 163821
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ACZ45006

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163822
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ45007

<400> 163822
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cgacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163823
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ45008

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163824
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ45009

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163825
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ45010

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163826
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ45012

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163827
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ45013

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcagcaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163828
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ45014

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163829
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ45016

<400> 163829

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163830
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ACZ45028

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163831
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ45029

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163832
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ45030

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaccuaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cauccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163833
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ45031

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgugggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163834
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ45034

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccccc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163835
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ45036

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163836
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ45037

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163837
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ45038

<400> 163837
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163838
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ45039

<400> 163838
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163839
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ45040

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163840
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 163840
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163841
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ52568

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163842
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ52569

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163843
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ53956

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcacccu gaacuggcug caccagcugc agaacagaua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagcgug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagag aggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163844
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ53967

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acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcacccu gaacuggcug caccagcugc agaacagaua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacaagcug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcagc aucauguggg ccugccagag aggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163845
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ53978

<400> 163845
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugaagagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ucggcgugag ccagaacggc accagcagcg ccugcaagag aaucagcauc 480

accgugagcu ucaacaagcu gaacuggcug caccagcuga aguacagaua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca ccggcaagcu gaacaagcug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagag aggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163846
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ56080

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163847
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ61118

<400> 163847

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccagagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163848
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ACZ61119

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 163849
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ61122

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163850
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ61123

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 163851
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ74627

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163852
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ81554

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gugaccguga cccacagcgu gaaccugcug gagaacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcaccg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163853
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ81555

<400> 163853
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug ggcccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163854
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ81556

<400> 163854
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgccagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacaagg agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 163855
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ81557

<400> 163855
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcggcagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccaggcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163856
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ81558

<400> 163856
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163857
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ81559

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 163858
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ81632

<400> 163858
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163859
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ81642

<400> 163859
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163860
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ81652

<400> 163860
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagagaaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccga ggccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163861
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ92130

<400> 163861
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaucg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163862
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ92131

<400> 163862
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163863
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ92132

<400> 163863
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163864
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ92133

<400> 163864
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163865
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ92134

<400> 163865

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163866
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ95465

<400> 163866
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163867
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ95837

<400> 163867
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163868
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ95847

<400> 163868
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163869
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ95857

<400> 163869
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gaccagcaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163870
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ95867

<400> 163870
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163871
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ95887

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163872
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ95897

<400> 163872
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163873
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ95907

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccguguac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163874
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ95927

<400> 163874
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163875
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ95937

<400> 163875
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaacgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163876
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 163876
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__ACZ95957

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163878
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163879
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ95977

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaacgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163880
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ95987

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163881
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163882
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96007

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 163883
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96017

<400> 163883

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163884
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ACZ96027

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163885
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96047

<400> 163885
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaacgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163886
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96057

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ugcacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163887
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96069

<400> 163887
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcaacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163888
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96089

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaacgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163889
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96119

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163890
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96129

<400> 163890
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gaguucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163891
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96149

<400> 163891
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163892
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96159

<400> 163892
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163893
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96179

<400> 163893
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163894
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 163894
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ugcacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163895
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96199

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163896
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96209

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163897
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96219

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caaguucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gaccagcaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgccggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163898
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96229

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163899
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ96239

<400> 163899
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__ACZ96249

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ACZ96269

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ACZ96299

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163903
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACZ96309

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163904
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hemagglutinin__InfluenzaA__ACZ96319

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aucugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 163905
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<212> RNA
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hemagglutinin__InfluenzaA__ACZ96329

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aucugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 163906
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ACZ96339

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163907
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96349

<400> 163907
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163908
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96359

<400> 163908
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aucugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163909
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96372

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163910
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96382

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aucugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163911
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96392

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163912
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163913
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96415

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163914
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96425

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163915
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ACZ96435

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggcccagcu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugauggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163916
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ACZ96445

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163917
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163918
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96496

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163919
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96506

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163920
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96526

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163921
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96536

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaagcacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163922
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96549

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163923
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96559

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163924
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96569

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163925
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96579

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

agcagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163926
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96589

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163927
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96599

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa caccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163928
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96609

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaccugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163929
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96619

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163930
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ96629

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163931
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96639

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163932
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96649

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163933
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96659

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163934
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96669

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163935
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ96679

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163936
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96689

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163937
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96699

<400> 163937

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163938
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96719

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163939
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96729

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163940
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96739

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163941
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96749

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163942
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96759

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163943
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96769

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163944
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96779

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163945
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96789

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163946
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96809

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaacgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu cgccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163947
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96819

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163948
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ96829

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163949
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96839

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163950
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96849

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gaccagcaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163951
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96859

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163952
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96869

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163953
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163954
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96899

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacagcagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163955
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96909

<400> 163955

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163956
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ96919

<400> 163956
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163957
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96929

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163958
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96939

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163959
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ96949

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163960
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ97021

<400> 163960
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163961
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ97343

<400> 163961
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaacgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163962
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ97353

<400> 163962
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaacgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163963
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ97363

<400> 163963
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163964
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ97383

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

accagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163965
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ97393

<400> 163965
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163966
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ98178

<400> 163966
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acuacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163967
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98188

<400> 163967
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163968
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98198

<400> 163968
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163969
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ98208

<400> 163969
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163970
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ98218

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163971
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 163971
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163972
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98238

<400> 163972
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163973
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98248

<400> 163973

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163974
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98258

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163975
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98268

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163976
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98278

<400> 163976
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gaccagcaag 900

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163977
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ98288

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gaccagcaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163978
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ACZ98298

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163979
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACZ98318

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccacauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163980
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ98328

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163981
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ98338

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163982
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98348

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163983
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98358

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163984
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACZ98368

<400> 163984
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163985
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98388

<400> 163985
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163986
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163987
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98408

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163988
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ98418

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 163989
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cagugcagaa ucugcaucug a 1701

<210> 163990
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98438

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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<210> 163991
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98448

<400> 163991

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 163992
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<212> RNA
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<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gaccagcaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163993
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ98546

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cugaccaccg gccugagaaa cgugcccagc 1020

auccaguaca gaggccuguu cggcgccauc accggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163994
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ98560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccaguaca gaggccuguu cggcgccauc accggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 163995
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ACZ98567

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc accggcuuca ucgaggaggg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163996
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ98671

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163997
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACZ98681

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 163998
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACZ98691

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 163999
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADA60799

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164000
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADA69302

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164001
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA69312

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164002
<211> 1701
<212> RNA
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<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164003
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA69332

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164004
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA70329

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164005
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA71150

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gugaccguga cccacagcgu gaaccuggug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 164006
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADA71152

<400> 164006
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164007
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADA71154

<400> 164007
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aacagcgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuacuucggc cacuucgccg acuacgagga gcugagagag 360

caguucggca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccagc 600

aucaacgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagaccugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucaacgacc agagaacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccagag acaccaucau cuucgaggcc 780

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aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacac ccccagcauc 1020

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagccugaug 1260

gacauccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<400> 164009

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<211> 1698
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu ggugagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgccagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 164011
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA71168

<400> 164011
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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca aggccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcggccugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgugc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gugaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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<212> RNA
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hemagglutinin__InfluenzaA__ADA71170

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ggcaccguga cccccagcgg caaccuggug gagaacagcc ccaacggcaa gcugugccug 180

cugaagggca ucacccccu gcagcugggc aagugcagcg uggccggcug gauccugggc 240

aaccccaagu gggagcugcu ggugagcaag gagagcugga gcuacaucgg caagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuuccccu acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgccagcgcc agcugcagcc acaacggcga gaacagcuuc 480

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aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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<210> 164013
<211> 1701

<212> RNA
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<400> 164013
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaugcaaca ucugcaucug a 1701

<210> 164014
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgccagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA71191

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164017
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<220>
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hemagglutinin__InfluenzaA__ADA79587

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aacagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<220>
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hemagglutinin__InfluenzaA__ADA79607

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164019
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADA83043

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcaaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164021
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA83580

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164022
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADA83587

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164023
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<212> RNA
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hemagglutinin__InfluenzaA__ADA83591

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucagcauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 164024
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADA83595

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164025
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164026
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADA83603

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164027
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA83611

<400> 164027

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164028
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADA83615

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164029
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA83622

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag acuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaagcu gaagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164030
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA83633

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<212> RNA
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hemagglutinin__InfluenzaA__ADA83637

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164032
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<212> RNA
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hemagglutinin__InfluenzaA__ADA83641

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ADA83645

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADA83648

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164035
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADA83656

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164036
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADA83660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 164037
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA83664

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag accgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164038
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcggcagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164039
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA83672

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164040
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA83676

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164041
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADA83680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164042
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA86068

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcau caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164043
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADA86086

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaacgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164044
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADA86087

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccuuc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 164045
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADA86088

<400> 164045

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164046
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03603

<400> 164046
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa uggacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164047
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03604

<400> 164047
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164048
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03605

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa uggacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164049
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03607

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164050
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03609

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164051
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03611

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164052
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03612

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccuuc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164053
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03614

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164054
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03617

<400> 164054
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag caaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164055
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03619

<400> 164055
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164056
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADB03620

<400> 164056
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagggcaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucg ugcccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164057
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03622

<400> 164057
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164058
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03623

<400> 164058
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164059
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03628

<400> 164059
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164060
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB03629

<400> 164060
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164061
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADB03630

<400> 164061
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag caaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164062
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB25319

<400> 164062
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164063
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB25321

<400> 164063

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164064
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB27970

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164065
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB27980

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164066
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB54352

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164067
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB54355

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164068
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB65926

<400> 164068
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugccug 180

cugaagggca aggccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcggccugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggg cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagauggg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucggc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 164069
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB80153

<400> 164069
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uucgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcaccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 164070
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB81399

<400> 164070
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164071
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB81409

<400> 164071
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164072
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB81419

<400> 164072
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccgaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164073
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB81429

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164074
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADB81439

<400> 164074
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164075
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB81449

<400> 164075
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164076
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB81459

<400> 164076
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cggcggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164077
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB82655

<400> 164077
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaac 180

cugagaggca aggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu guucgccgug aacagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucacca gcuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg caccaacggc 480

uucuacagaa accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagaaag 540

agcuacguga acaacaagaa gaaggaggug cuggugcugu ggggcaucca ccacccccc 600

accaacaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcagaaaguu caagcccgag aucgccgaga gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accuggguggc ccccagauac gccuucgcca ugaacagagg ccccgugagc 840

ggcaucauca ccagcgacgc ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcgagugc 960

cccaaguacg ugaagagcac cagacugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacggcc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac agaaucacca acaaggugaa cagcgugauc 1200

gagaagauga acauccaguu caccgccgug ggcaaggagu ucaaccaccu ggagagaaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

acccuguacg agaaggugaa gacccagcug agaaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcaucaa gaacggcacc 1500

uacaacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugc uggugagccu gggcgccauc ggcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164078
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB82656

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugaagggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu guucaaggcc aacagcugga gcuacaucgu ggagaccagc 300

uacagcgaca acggcaccug cuaccccggc gacuucacca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaaggc caacagcugg 420

cccaaccacg agaccaacaa gggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccag acugagcaag 540

agcuacguga acaacaagaa gaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugagcagc 660

agcaccuaca acaagagauu caagcccgag aucggcacca gacccaaggu gagagaccag 720

agcggcagaa ugaacuacua cuggaccauc guggagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca ugaagagaga cagcggcagc 840

ggcaucauca ugagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gacagaaaga gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gagaagauga acauccaguu caccgccgug ggcaaggagu ucagccaccu ggagaagaga 1260

guggagaacc ugaacaagaa gguggacgac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac agcugcaugg agagcaucaa gaacgagacc 1500

uacgacuaca gcaaguacag cgaggagagc agacugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcacccagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164079
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADB82944

<400> 164079
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164080
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB82950

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu cgagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164081
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89129

<400> 164081

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164082
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89139

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164083
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89149

<400> 164083
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacguggg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164084
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89150

<400> 164084
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164085
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89221

<400> 164085
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagaa ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164086
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89241

<400> 164086
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcgaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164087
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89251

<400> 164087
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164088
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89261

<400> 164088
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164089
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89271

<400> 164089
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg gcagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164090
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89281

<400> 164090
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164091
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89291

<400> 164091
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164092
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADB89301

<400> 164092
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164093
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB89311

<400> 164093
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164094
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89321

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcgag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164095
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB89331

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164096
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89341

<400> 164096
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164097
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADB89351

<400> 164097
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164098
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89361

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164099
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89371

<400> 164099

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164100
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB89381

<400> 164100
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164101
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB89391

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ugcacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164102
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89401

<400> 164102
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164103
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89411

<400> 164103
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164104
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89431

<400> 164104
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164105
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89441

<400> 164105
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164106
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89461

<400> 164106
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164107
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89481

<400> 164107
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164108
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB89491

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164109
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB89501

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

cugguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164110
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 164110
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164111
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89531

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164112
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89541

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164113
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89551

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164114
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89561

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164115
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADB89571

<400> 164115
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164116
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB89581

<400> 164116
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164117
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB89591

<400> 164117

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cugggcccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164118
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89601

<400> 164118
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cugaccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164119
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89611

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164120
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB89621

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164121
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADB89631

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164122
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89641

<400> 164122
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164123
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89651

<400> 164123
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164124
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89661

<400> 164124
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164125
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89671

<400> 164125
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164126
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89681

<400> 164126
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164127
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89691

<400> 164127
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164128
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADB89701

<400> 164128
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164129
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89711

<400> 164129
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164130
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADB89721

<400> 164130
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucga caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu accuguggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcaaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164135
<211> 1701
<212> RNA
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<220>
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<400> 164135

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<210> 164136
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

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<210> 164137
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADC32412

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164138
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADC32413

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164139
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADC32414

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164141
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ADC32416

<400> 164141
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164142
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ADC32417

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gugaccguga cccacagcgu gaaccugcug gaguacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164143
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<220>
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hemagglutinin__InfluenzaA__ADC32418

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164144
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADC32419

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 164145
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADC32420

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164146
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADC32421

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164147
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADC32422

<400> 164147
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugauggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164148
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADC32423

<400> 164148
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa ggugaacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164149
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADC32434

<400> 164149
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164150
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADC32435

<400> 164150
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164151
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADC34940

<400> 164151
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaga 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcgac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug cacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164152
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADC38987

<400> 164152
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164153
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADC38997

<400> 164153

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggacgug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164154
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADC39007

<400> 164154
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164155
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggccu gggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 164156
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADC45626

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

agcggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 164157
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADC45637

<400> 164157
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

agcggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 164158
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADC45648

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagca ucgccggcug ggugcugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 164159
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<212> RNA
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hemagglutinin__InfluenzaA__ADC45659

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 164160
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADC45670

<400> 164160
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cggcagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 164161
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADC45681

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgccagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagaaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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hemagglutinin__InfluenzaA__ADC45692

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag aagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaccacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

agcggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

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cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 164165
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hemagglutinin__InfluenzaA__ADC45725

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 164166
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<212> RNA
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hemagglutinin__InfluenzaA__ADC45736

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacaccu acgugagcgu ggugagcagc 660

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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hemagglutinin__InfluenzaA__ADC45747

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 164168
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADC45758

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

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aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 164169
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<212> RNA
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hemagglutinin__InfluenzaA__ADC45780

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<400> 164171

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccaugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaagacccu guacaacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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hemagglutinin__InfluenzaA__ADC45824

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<211> 1698
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hemagglutinin__InfluenzaA__ADC45835

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugacc 1560

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<210> 164174
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hemagglutinin__InfluenzaA__ADC45846

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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<210> 164175
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__ADC53558

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cagugcagaa ucugcaucug a 1701

<210> 164176
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14087

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<210> 164177
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14089

<400> 164177
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164178
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14093

<400> 164178
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164179
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14095

<400> 164179
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugcu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164180
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14097

<400> 164180
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164181
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADD14099

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164182
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADD14101

<400> 164182
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164183
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD14103

<400> 164183
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164184
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD14111

<400> 164184
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaucagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164185
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14115

<400> 164185
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164186
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14117

<400> 164186
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164187
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD14119

<400> 164187
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164188
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14121

<400> 164188
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164189
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD14123

<400> 164189

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164190
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADD14127

<400> 164190
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164191
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD14129

<400> 164191
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccagccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164192
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD14133

<400> 164192
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacguggacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcuuc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164193
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14135

<400> 164193
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164194
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14137

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164195
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14139

<400> 164195
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164196
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14143

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164197
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14145

<400> 164197
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164198
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14147

<400> 164198
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164199
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD14151

<400> 164199
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccagagccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164200
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADD14153

<400> 164200
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164201
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14155

<400> 164201
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164202
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14157

<400> 164202
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164203
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD14162

<400> 164203
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164204
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD14172

<400> 164204
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164205
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADD14182

<400> 164205
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164206
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD14192

<400> 164206
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164207
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD14202

<400> 164207

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164208
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD21447

<400> 164208
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu guucaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaagga gaaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acaagaaguu cagacccgag aucgccgcca gacccaaggu gagaggccag 720

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gccaccgaga accugguggu gcccagauac gccuucgcca ugaagagagg cagcggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggccugcugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugag aaacggcgcc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164209
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD21457

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gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu guucaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaagga gaaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acaagaaguu cagacccgag aucgccgcca gacccaaggu gagaggccag 720

accggcagaa ugaacuacua cuggacccug guggagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaagagagg cagcggcagc 840

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ggcgccguga acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<212> RNA
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hemagglutinin__InfluenzaA__ADD21467

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucagagacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag aggccaggag 720

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 164211
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD21560

<400> 164211
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agcagcagca ccggcagaau cugcaacagc ccccaccaca uccuggacgg caagaacugc 240

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uucaacugga ccggcgugac ccaggacggc agcagcuaca ccugcagaag aaagagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaaccugg acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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aucaagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagagc 1560

gugcagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caugagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucaugugga ccugccagaa gggcaacauc 1680

aagugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD21734

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164213
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD21744

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164214
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD21764

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<210> 164215
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD21774

<400> 164215
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164216
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD21784

<400> 164216
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164217
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD21794

<400> 164217
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164218
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADD21804

<400> 164218
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164219
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD21814

<400> 164219
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccagcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164220
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD21824

<400> 164220
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164221
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD21834

<400> 164221
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164222
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD21844

<400> 164222
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164223
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADD21854

<400> 164223
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164224
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<220>
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hemagglutinin__InfluenzaA__ADD21864

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164225
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<212> RNA
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<400> 164225

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164226
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hemagglutinin__InfluenzaA__ADD21894

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164227
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<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD22501

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164228
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD22511

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 164229
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD22521

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 164230
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD22531

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164231
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD22541

<400> 164231
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<220>
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hemagglutinin__InfluenzaA__ADD22604

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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hemagglutinin__InfluenzaA__ADD22614

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD22624

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agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164247
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD22732

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 164248
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD22742

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagcuaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164249
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD22752

<400> 164249
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164250
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD22762

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164251
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD22772

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164252
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD22782

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 164253
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD22792

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164254
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADD22802

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ADD22822

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcgccgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164257
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ADD22832

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164258
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD22842

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164259
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD22852

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucguga ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 164260
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD22941

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 164261
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD22951

<400> 164261

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164262
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD22961

<400> 164262
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__ADD23112

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__ADD23122

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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hemagglutinin__InfluenzaA__ADD23132

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<212> RNA
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hemagglutinin__InfluenzaA__ADD23142

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcaggg ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164274
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<212> RNA
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hemagglutinin__InfluenzaA__ADD23192

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD23202

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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<210> 164276
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<220>
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hemagglutinin__InfluenzaA__ADD23220

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD23230

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 164283
<211> 1701

<212> RNA
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<210> 164284
<211> 1701
<212> RNA
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<210> 164285
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD23330

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164290
<211> 1701
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 164291
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hemagglutinin__InfluenzaA__ADD23435

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 164293
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccagaagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<400> 164297

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<210> 164299
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<212> RNA
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hemagglutinin__InfluenzaA__ADD24004

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<210> 164301
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__ADD52537

<400> 164301
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164302
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD64203

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__ADD64204

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgagaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccagagagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164304
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164305
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD64206

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164306
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD64207

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164307
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD64208

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 164308
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADD64209

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<212> RNA
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hemagglutinin__InfluenzaA__ADD64210

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164310
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD64211

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164311
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD64212

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164312
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD64213

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164313
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD64214

<400> 164313
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gugaccguga cccacagcgu gaaccugcug gagaacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164314
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD64215

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164315
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD64216

<400> 164315

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164316
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD64217

<400> 164316
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164317
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD74350

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164318
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<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagag aaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164319
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD74370

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164320
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD74398

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164321
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD74428

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cagugcagaa ucugcaucug a 1701

<210> 164322
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD74438

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 164323
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD74448

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164324
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD74458

<400> 164324
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucaccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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hemagglutinin__InfluenzaA__ADD74508

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccga ggccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__ADD74518

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__ADD74548

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<400> 164333

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 164336
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<210> 164337
<211> 1701

<212> RNA
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<210> 164338
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADD74608

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<210> 164339
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD74618

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<220>
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hemagglutinin__InfluenzaA__ADD74668

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug gugaagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD74698

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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hemagglutinin__InfluenzaA__ADD74708

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agaagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcggcuaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cagugcagaa ucugcaucug a 1701

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<212> RNA
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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164356
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD74808

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164357
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD74818

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164358
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD74838

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164359
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD74848

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164360
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD74858

<400> 164360
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg caccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164361
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD74868

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164362
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADD74878

<400> 164362
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164363
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD74888

<400> 164363
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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<211> 1701
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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD74998

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgaga gaggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADD75008

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164373
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164374
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD75028

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164375
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD75058

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164376
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD75088

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164377
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164378
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD75108

<400> 164378
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164380
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164382
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADD75148

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164383
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD75158

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164384
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD84494

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164385
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164386
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD84496

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<400> 164387

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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hemagglutinin__InfluenzaA__ADD96886

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<212> RNA
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<220>
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164403
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164404
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD96916

<400> 164404
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164405
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD96926

<400> 164405

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164406
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD96936

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcugaucaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164407
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD96946

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164408
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD96956

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164409
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADD96976

<400> 164409
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__ADD97123

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<210> 164415
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD97161

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<210> 164416
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 164417
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD97181

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<212> RNA
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hemagglutinin__InfluenzaA__ADD97201

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164419
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<212> RNA
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hemagglutinin__InfluenzaA__ADD97211

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ADD97231

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164421
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD97241

<400> 164421
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164422
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD97251

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164423
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD97261

<400> 164423

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 164424
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADD97271

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cugagaggcg ugaccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164425
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164433
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<220>
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hemagglutinin__InfluenzaA__ADD97371

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164435
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD97391

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164436
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD97411

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164437
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD97421

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164438
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164439
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD97441

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164440
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD97451

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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hemagglutinin__InfluenzaA__ADD97698

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agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgaga uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgaga uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164475
<211> 1701
<212> RNA
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164476
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADD98098

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADD98118

<400> 164477

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<210> 164478
<211> 1701
<212> RNA
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<220>
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<210> 164479
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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugau ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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hemagglutinin__InfluenzaA__ADD98198

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hemagglutinin__InfluenzaA__ADE20321

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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hemagglutinin__InfluenzaA__ADE20331

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 164488
<211> 1701
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164492
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE20628

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cagugcagaa ucugcaucug a 1701

<210> 164493
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADE20638

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164494
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADE20648

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<400> 164495

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 164500
<211> 1701
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hemagglutinin__InfluenzaA__ADE20718

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<210> 164501
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ADE20728

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 164502
<211> 1701
<212> RNA
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<220>
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164503
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE20748

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164504
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE20758

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164505
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADE20768

<400> 164505
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164506
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caagaaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164507
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADE20788

<400> 164507
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164508
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADE20808

<400> 164508
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagga gaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164509
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADE20818

<400> 164509
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164510
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADE20828

<400> 164510
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagccu guucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164511
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__ADE20858

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164513
<211> 1701
<212> RNA
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<220>
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<400> 164513

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gugaccguga cccacagcgu gaaccugcug gagggcaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gaccaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164514
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accaucgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaaguacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164515
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE20888

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 164516
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADE20898

<400> 164516
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 164517
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADE20908

<400> 164517
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164518
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADE20918

<400> 164518
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg aggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacagcgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 164526
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgaga uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 164529
<211> 1701
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164530
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADE21058

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164531
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADE21068

<400> 164531

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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<210> 164532
<211> 1698
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADE28761

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucggcaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 164533
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ADE28780

<400> 164533
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaccg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cagugcagaa ucugcaucug a 1701

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<220>
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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164557
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADE29085

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccga ggccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaccuu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164558
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE29095

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaccuu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164559
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE34191

<400> 164559
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164560
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164561
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE34213

<400> 164561
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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag aaaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164562
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE34224

<400> 164562
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164563
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE34235

<400> 164563
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaccaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 164564
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE34246

<400> 164564
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164565
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164566
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE34268

<400> 164566
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga ggugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164567
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE45499

<400> 164567

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164568
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164569
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE45503

<400> 164569
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164570
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADE45505

<400> 164570
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164571
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADE45507

<400> 164571
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164572
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADE45509

<400> 164572
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164573
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE45511

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164574
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE45513

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ucaacuacua cuggacccug guggagcccg gcgacaagau caucuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164575
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADE75388

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaga acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164576
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADE75390

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164577
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF10067

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164578
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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<210> 164579
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADF10087

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 164580
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF10097

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164581
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF10107

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164582
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF10117

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164583
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF10127

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagag ugugcaucug a 1701

<210> 164584
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF10137

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164585
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF10154

<400> 164585

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164586
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADF10174

<400> 164586
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 164587
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF10190

<400> 164587
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agagagugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cagugcagaa ucugcaucug a 1701

<210> 164600
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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 164601
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hemagglutinin__InfluenzaA__ADF10828

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<211> 1701
<212> RNA
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<400> 164603

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 164608
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgagauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164615
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<210> 164616
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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<210> 164617
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 164618
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164619
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

uucuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164621
<211> 1701
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hemagglutinin__InfluenzaA__ADF27449

<400> 164621

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 164622
<211> 1701
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cagugcagaa ucugcaucug a 1701

<210> 164623
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164624
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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 164625
<211> 1701

<212> RNA
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<210> 164626
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acagcgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaacgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__ADF27865

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 164655
<211> 1701
<212> RNA
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<210> 164656
<211> 1701
<212> RNA
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<220>
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<210> 164657
<211> 1701
<212> RNA
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<220>
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<400> 164657

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164658
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF27925

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaac 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164659
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF27935

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccaagu gcgagagccu gagcaccgag agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164660
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF27955

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaac 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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<210> 164661
<211> 1701

<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADF27965

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caagaaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164662
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF27975

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164663
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cagugcagaa ucugcaucug a 1701

<210> 164664
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADF27995

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accaacgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cagugcagaa ucugcaucug a 1701

<210> 164665
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADF28005

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164666
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADF28015

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 164668
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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<210> 164669
<211> 1701
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaacuacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cagugcagaa ucugcaucug a 1701

<210> 164670
<211> 1701
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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<210> 164671
<211> 1701
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<210> 164672
<211> 1701
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcac ccugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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<210> 164679
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<212> RNA
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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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<210> 164696
<211> 1701
<212> RNA
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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164697
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<212> RNA
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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<210> 164698
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164699
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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cagugcagaa ucugcaucug a 1701

<210> 164700
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hemagglutinin__InfluenzaA__ADF83823

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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<210> 164701
<211> 1701
<212> RNA
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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<210> 164702
<211> 1701
<212> RNA
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<210> 164703
<211> 1701
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hemagglutinin__InfluenzaA__ADF83853

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<210> 164704
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aacagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164705
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164706
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164707
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADF83915

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164708
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADF84441

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccagccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164709
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cagugcagaa ucugcaucug a 1701

<210> 164710
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADF84469

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cagugcagaa ucugcaucug a 1701

<210> 164711
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF84479

<400> 164711

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164712
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164713
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF85017

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164714
<211> 1701
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<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF87152

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164715
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADF87162

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164716
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF87172

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164717
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF87182

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164718
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADF87192

<400> 164718
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcaucug a 1701

<210> 164719
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADF87202

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuucgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164720
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF87212

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164721
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF87232

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg aggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164722
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADF87242

<400> 164722
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164723
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF87252

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaga gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164724
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF87262

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164725
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADF87272

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 164726
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADF87282

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164727
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADF87292

<400> 164727
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc ggcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164728
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF87302

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164729
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 164729

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164730
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164731
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF87351

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgacagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164732
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF87361

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 164733
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADF87371

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<210> 164734
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG08115

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164735
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADG21004

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164736
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21006

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164737
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caagagcuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164738
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga gauucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164739
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21010

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164740
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 164740
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164741
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21012

<400> 164741
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 164742
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21013

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164743
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21014

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164744
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164745
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagaca cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164746
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acacccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcaa gaucaucgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcaucaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caucggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164747
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21020

<400> 164747

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagagcggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaucgug 660

agcaccaaga gaagccagca gaccgugacc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164748
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 164749
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21023

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164750
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21024

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcgccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 164751
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21026

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacu gagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 164752
<211> 1701
<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164753
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21038

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164754
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21040

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164755
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21041

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccgug agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164756
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21042

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 164757
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21043

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164758
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADG21045

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 164759
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<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164760
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164761
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG21049

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164762
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21122

<400> 164762
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164763
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG21123

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164764
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21124

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 164765
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21125

<400> 164765

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164766
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21126

<400> 164766
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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164776
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164777
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG21137

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164778
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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<210> 164780
<211> 1701
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<220>
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cagugcagaa ucugcaucug a 1701

<210> 164781
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADG21141

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164782
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21142

<400> 164782
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgagaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164783
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADG21143

<400> 164783

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164784
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21144

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164785
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21145

<400> 164785
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164786
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21146

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164787
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21147

<400> 164787
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164788
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21148

<400> 164788
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164789
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21149

<400> 164789
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164790
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<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__ADG21151

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164792
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADG21152

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164793
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG21153

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164794
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 164795
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21155

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164796
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21156

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164797
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21158

<400> 164797
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagagaaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164798
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21159

<400> 164798
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164799
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21160

<400> 164799
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagagaaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164800
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21161

<400> 164800
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacaacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164801
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21163

<400> 164801

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164802
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21165

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac caacagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164803
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21166

<400> 164803
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164804
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21168

<400> 164804
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

uucuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164805
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21169

<400> 164805
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164806
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164807
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21173

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164808
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164809
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG21175

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164810
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21176

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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cagugcagaa ucugcaucug a 1701

<210> 164811
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADG21177

<400> 164811
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164812
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADG21178

<400> 164812
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164813
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG21179

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164814
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADG21180

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164815
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADG21181

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164816
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21182

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164817
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21183

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164818
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21184

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<210> 164819
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21185

<400> 164819

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164820
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21188

<400> 164820
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164821
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

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aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu gauccuggcc accggccuga gaaacagccc ccagggcgag 1020

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cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

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<211> 1704
<212> RNA
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

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aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacggcgcc 600

gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgagc uggaguacgg caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gggcgagaga 1020

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ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

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ggcugcuucg aguucuacca cagaugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cuguuccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 164823
<211> 1704

<212> RNA
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

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aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgccgcc 600

gagcagaccg gccuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacguga ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

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aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gggcgagaga 1020

agaagaaaga agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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ggcugcuucg aguucuacca cagaugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cuguuccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 164824
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21420

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

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aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgagc uggaguacgg caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

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accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

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cugcagugca gaaucugcau cuga 1704

<210> 164825
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21422

<400> 164825
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccaccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacaac gccuacccca ccaucaagag aagcuacaac 540

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gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

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aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

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accuacgacu acccccagua cagcgaggag gccagaagca agagagagga gaucagcggc 1560

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agccuggccc uggccaucau gguggccggc cuguuccugu ggaugugcag caacggcagc 1680

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<210> 164826
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21425

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

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auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

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accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

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<210> 164827
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21429

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcgugg agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

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cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

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aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgccgcc 600

gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

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auggaguucu ucuggaccau ccugaagagc aacgacguga ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

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<210> 164828
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21437

<400> 164828
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

aacguggugu ggcugaccca gaagaacaac gccuacccca ccaucaagaa gagcuacaac 540

aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgccgcc 600

gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacguga ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgagc uggaguacgg caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gggcgagaga 1020

agaagaaaga agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca cagaugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cuguuccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 164829
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21439

<400> 164829
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagggcag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacaac gccuacccca ccaucaagaa gagcuacaac 540

aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgccgcc 600

gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccca gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgagc uggaguacgg caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gggcgagaga 1020

agaagaaaga agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca cagaugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cuguuccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 164830
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADG21441

<400> 164830
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccagcaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacaac gccuacccca ccaucaagaa gagcuacaac 540

aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgaggcc 600

gagcagacca gccuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgagc uggaguacgg caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gggcgagaga 1020

agaagaaaga agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca cagaugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cuguuccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 164831
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21443

<400> 164831
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccaccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacaac gccuacccca ccaucaagaa gagcuacaac 540

aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgccgcc 600

gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgagc uggaguacgg caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gggcgagaga 1020

agaagaaaga agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca cagaugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cuguuccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 164832
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21445

<400> 164832
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccagcaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacaac gccuacccca ccaucaagaa gagcuacaac 540

aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgaggcc 600

gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgagc uggaguacgg caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gggcgagaga 1020

agaagaaaga agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca cagaugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cuguuccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 164833
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21912

<400> 164833
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164834
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21913

<400> 164834
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164835
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21914

<400> 164835
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164836
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21915

<400> 164836
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca ucgagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164837
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21916

<400> 164837

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164838
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21917

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164839
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21918

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164840
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21919

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugacccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164841
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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cagugcagaa ucugcaucug a 1701

<210> 164842
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21922

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164843
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21923

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gugaccguga cccacagcgc caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164844
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21924

<400> 164844
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164845
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21925

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164846
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21926

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccauccu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga aaccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164847
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADG21927

<400> 164847
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164848
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADG21928

<400> 164848
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccagagu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164849
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21930

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 164850
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21931

<400> 164850
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164851
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21932

<400> 164851
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164852
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164853
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164854
<211> 1701
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hemagglutinin__InfluenzaA__ADG21935

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164855
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21936

<400> 164855

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164856
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164857
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG21938

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcaucug a 1701

<210> 164858
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADG21939

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164859
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21940

<400> 164859
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164860
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21941

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164861
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21943

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aacagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164862
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21944

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164863
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21945

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164864
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG21946

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164865
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG21947

<400> 164865
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164866
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADG21948

<400> 164866
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164867
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG27794

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaac cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164868
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164869
<211> 1701
<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164870
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG27974

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cugauccugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164871
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 164871
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164872
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG27988

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164873
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG27997

<400> 164873

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164874
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG28011

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 164877
<211> 1701

<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cagugcagaa ucugcaucug a 1701

<210> 164878
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cagugcagaa ucugcaucug a 1701

<210> 164879
<211> 1701
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<210> 164880
<211> 1701
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<210> 164881
<211> 1701
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<210> 164882
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164883
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42213

<400> 164883
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164884
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164885
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42243

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164886
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42253

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164887
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42263

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164888
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42273

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164889
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADG42283

<400> 164889
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164890
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hemagglutinin__InfluenzaA__ADG42293

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 164891
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 164891

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucguga ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164892
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADG42313

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164893
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ADG42323

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 164894
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164895
<211> 1701

<212> RNA
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cagugcagaa ucugcaucug a 1701

<210> 164896
<211> 1701
<212> RNA
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<220>
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cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 164897
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164898
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42393

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacgagaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164899
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42403

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164900
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42413

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164901
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42423

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164902
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164903
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42453

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164904
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42463

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164905
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42473

<400> 164905
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<212> RNA
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<210> 164911
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<210> 164912
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<210> 164913
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42583

<400> 164913
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagca cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164914
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42593

<400> 164914
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164915
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42603

<400> 164915
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagaaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcagcauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164916
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42613

<400> 164916
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164917
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42623

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164918
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42633

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164919
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42643

<400> 164919
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgc caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ccgcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacguga acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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cagugcagaa ucugcaucug a 1701

<210> 164920
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADG42653

<400> 164920
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164921
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42663

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164922
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42673

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc ggcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164923
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42683

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164924
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42693

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164925
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164926
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42723

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 164927
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42743

<400> 164927

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164928
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42753

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cagcggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164929
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164930
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164931
<211> 1701

<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164932
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADG42793

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164933
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42803

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164934
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG42813

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164935
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42823

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugacccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164936
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42833

<400> 164936
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164937
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42843

<400> 164937
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164938
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 164938
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164939
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42863

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccauccu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accaucgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaaguacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164940
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42883

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgaga uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164941
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42893

<400> 164941
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caaccugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164942
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42903

<400> 164942
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164943
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG42913

<400> 164943
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164944
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG42923

<400> 164944
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164945
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG57087

<400> 164945

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccaucagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 164946
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADG57088

<400> 164946
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164947
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG57089

<400> 164947
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucc aguacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccgaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164948
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG57090

<400> 164948
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag caucuaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

cagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164949
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG57091

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagagagg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164950
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG57092

<400> 164950
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaucaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164951
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG57093

<400> 164951
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cguguggagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164952
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG57094

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 164953
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG57095

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164954
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG57097

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 164955
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG57098

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164956
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 164957
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG57100

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccggc ggcaaggagu ucaaccaccu ggagaagaga 1260

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cagugcagaa ucugcaucug a 1701

<210> 164958
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58939

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164959
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58940

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164960
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58941

<400> 164960
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac gagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164961
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccugcac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164962
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58943

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164963
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58944

<400> 164963

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164964
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADG58946

<400> 164964
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164965
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG58947

<400> 164965
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164966
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG58948

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164967
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG58949

<400> 164967
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164968
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58951

<400> 164968
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcggca acggcaccug cuaccccggc gaguucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164969
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58952

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcggca acggcaccug cuaccccggc gaguucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164970
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58953

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcggca acggcaccug cuaccccggc gaguucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164971
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG58954

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcggca acggcaccug cuaccccggc gaguucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaucg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164972
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58955

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcggca acggcaccug cuaccccggc gaguucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 164973
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58956

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcggca acggcaccug cuaccccggc gaguucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164974
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADG58957

<400> 164974
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcggca acggcaccug cuaccccggc gaguucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164975
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58959

<400> 164975
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aacagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164976
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58960

<400> 164976
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164977
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58961

<400> 164977
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164978
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58962

<400> 164978
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164979
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG58963

<400> 164979
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164980
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG58964

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 164981
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG58965

<400> 164981

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164982
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG58966

<400> 164982
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164983
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58967

<400> 164983
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164984
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG58968

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164985
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59628

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164986
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59629

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164987
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59630

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164988
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG59631

<400> 164988
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 164989
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG59632

<400> 164989
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164990
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG59633

<400> 164990
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164991
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164992
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 164993
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 164994
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADG59638

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164995
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADG59639

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 164996
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG59641

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

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<210> 164997
<211> 1701
<212> RNA
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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__ADG59644

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ADG59646

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__ADG59647

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165001
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hemagglutinin__InfluenzaA__ADG59648

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165002
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ADG59649

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 165003
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG59650

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<210> 165004
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ADG59651

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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<210> 165005
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG59652

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165006
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<220>
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hemagglutinin__InfluenzaA__ADG59653

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__ADG59655

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165008
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<212> RNA
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hemagglutinin__InfluenzaA__ADG59656

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165009
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG59657

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

acccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165010
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165011
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 165012
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG59660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165013
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59662

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165014
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hemagglutinin__InfluenzaA__ADG59663

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcgccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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hemagglutinin__InfluenzaA__ADG59667

<400> 165017

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggaccccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggaccccg gcgacaagau caccuucgag 780

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<210> 165020
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<212> RNA
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hemagglutinin__InfluenzaA__ADG59671

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggaccccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165021
<211> 1701

<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggaccccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165022
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59673

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cugagaggcg uggccccccu gcaccugggc gagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165023
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59674

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165024
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<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165025
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59676

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165026
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59678

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165027
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165028
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADG59681

<400> 165028
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165029
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG59683

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucguga ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165030
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADG59684

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165031
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59685

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ugcaucggcu accacgccaa caacagcacc gacaccaucg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165032
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59686

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165033
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59687

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165034
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59688

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165035
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59689

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165036
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG59691

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165037
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59693

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165038
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59696

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165039
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59697

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagaac 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165040
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG59700

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccugaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165041
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG59701

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165042
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG59702

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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gagcugcugg ugcugcugga gaacgagaga aaccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165043
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG59703

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucguga ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165044
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADG76646

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165045
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADG76652

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165046
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165047
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADH01818

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165048
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADH01828

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165049
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADH01838

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165050
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01848

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165051
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADH01858

<400> 165051
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165052
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01868

<400> 165052
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165053
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01878

<400> 165053

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165054
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01888

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165055
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01898

<400> 165055
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165056
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01908

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165057
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01918

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgag agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagga gaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165058
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01928

<400> 165058
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgccagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165059
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01938

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguaca agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165060
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01948

<400> 165060
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165061
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01958

<400> 165061
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaacugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165062
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01968

<400> 165062
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165063
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01978

<400> 165063
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165064
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADH01988

<400> 165064
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165065
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH01998

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165066
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADH02008

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagggcaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcugaucaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagga gaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165067
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24508

<400> 165067
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165068
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI24515

<400> 165068
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ugcgugggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gcccaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagagcacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165069
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI24517

<400> 165069
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165070
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI24519

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165071
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24521

<400> 165071

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165072
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24523

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165073
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24525

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcgag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agaagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165074
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24527

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165075
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24529

<400> 165075
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165076
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24531

<400> 165076
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccugcu gggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcaaga ucugcaucug a 1701

<210> 165077
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI24536

<400> 165077
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165078
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24546

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165079
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24553

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165080
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24555

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165081
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24557

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165082
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADI24559

<400> 165082
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165083
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24561

<400> 165083
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165084
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24563

<400> 165084
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165085
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24565

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caagaaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165086
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24567

<400> 165086
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165087
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24569

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ucgagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165088
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24571

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165089
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24573

<400> 165089

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165090
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24575

<400> 165090
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacguggag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165091
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI24577

<400> 165091
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165092
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24581

<400> 165092
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug ggugcugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165093
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24583

<400> 165093
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccauccu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165094
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24590

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgc caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165095
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24597

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgc caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aacugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165096
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24612

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgc caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165097
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24619

<400> 165097
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgc caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgugg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165098
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI24621

<400> 165098
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcaccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165099
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI48184

<400> 165099
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca ugggcagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agagagugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165100
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 165100
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165101
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI48188

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

gacaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165102
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48190

<400> 165102
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165103
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48192

<400> 165103
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cugaccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165104
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48194

<400> 165104
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagcc uggugagcag cuucgagaga uucgagaucu uccccaagac caacagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165105
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADI48196

<400> 165105
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaca gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165106
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48198

<400> 165106
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165107
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hemagglutinin__InfluenzaA__ADI48200

<400> 165107

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165108
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI48202

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagau cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165109
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI48204

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacguggacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165110
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI48208

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165111
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI48210

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcaucug a 1701

<210> 165112
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI48212

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165113
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48214

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg ccgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165114
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48216

<400> 165114
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165115
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48218

<400> 165115
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accaggacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165116
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48220

<400> 165116
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

accaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccugggcu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165117
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48622

<400> 165117
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165118
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADI48632

<400> 165118
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165119
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48642

<400> 165119
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165120
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48652

<400> 165120
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165121
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48672

<400> 165121
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaca accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165122
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48682

<400> 165122
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165123
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165124
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI48702

<400> 165124
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165125
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48712

<400> 165125

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165126
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48722

<400> 165126
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165127
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48732

<400> 165127
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165128
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48742

<400> 165128
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165129
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI48752

<400> 165129
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aucagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<211> 1701
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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI49270

<400> 165137
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccagagagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165138
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI49280

<400> 165138
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165139
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI49312

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165140
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI49322

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165141
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADI49332

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165142
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI49342

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165143
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI49352

<400> 165143

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 165144
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI49362

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__ADI49382

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__ADI49392

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__ADI49717

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADI49727

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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hemagglutinin__InfluenzaA__ADI49737

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 165151
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADI49757

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165152
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI49767

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165153
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI49777

<400> 165153
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165154
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 165154
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcau cagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165155
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI49822

<400> 165155
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165156
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI50027

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaaguacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcauc 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165157
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI52834

<400> 165157
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165158
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI52835

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165159
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI52836

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag acuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165160
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI52837

<400> 165160
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gugaccguga cccacagcgu gaaccugcug gaggugaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaacggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165161
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI72915

<400> 165161

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165162
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI72916

<400> 165162
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165163
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI72917

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165164
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI72918

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacagagg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165165
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI72919

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165166
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI72920

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 165167
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI72921

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165168
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI72922

<400> 165168
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165169
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI72923

<400> 165169
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcccc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165170
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI72924

<400> 165170
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165171
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI72925

<400> 165171
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165172
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADI72926

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcggcuaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165173
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI72927

<400> 165173
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ccagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165174
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI72928

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccauccu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gaaaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165175
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI72929

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165176
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hemagglutinin__InfluenzaA__ADI72930

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165177
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcauc 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165178
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI72932

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagau cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 165179
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI75818

<400> 165179

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165180
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI75851

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcggccugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165181
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADI75884

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 165182
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI75917

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 165183
<211> 1698

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADI77349

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug auccuguggg gcgugcacca cccccccaac 600

auggccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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<210> 165184
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI77360

<400> 165184
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165185
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI99498

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug gugaagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165186
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI99560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcaacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165187
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI99570

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcaacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165188
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI99580

<400> 165188
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165189
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI99590

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 165190
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADI99610

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165191
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI99620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165192
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI99630

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gugaccguga cccacagcgu gaaccugcug gaggacaaga acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__ADI99660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADI99670

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165196
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADI99680

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<211> 1701
<212> RNA
<213> Artificial Sequence

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 165198
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI99700

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 165199
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI99710

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165200
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADI99720

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gagcagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165201
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADI99730

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165202
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ00497

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165203
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADJ00498

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165204
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ00501

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165205
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ18163

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165206
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ18165

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165207
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ18167

<400> 165207
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccuacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165208
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADJ18169

<400> 165208
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165209
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ18171

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcuggc ccuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuaccaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacaucc acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

cagggcagaa ugaacuacua cuggacccug guggagcugg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gaccaccacc 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165210
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ18173

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165211
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ18175

<400> 165211
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165212
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ18177

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

gugcagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165213
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ40444

<400> 165213
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165214
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ40454

<400> 165214
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

gagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__ADJ40464

<400> 165215

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ADJ40474

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagacagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165217
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<212> RNA
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hemagglutinin__InfluenzaA__ADJ40494

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga cccugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165218
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hemagglutinin__InfluenzaA__ADJ40514

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165219
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__ADJ40524

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165220
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165221
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADJ40554

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165222
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ40564

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165223
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ40574

<400> 165223
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165224
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADJ40584

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165225
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADJ40594

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165226
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADJ40604

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165227
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ40614

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165228
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ40634

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165229
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADJ40644

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ADJ80242

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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<210> 165241
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADJ80243

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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<210> 165242
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADJ80634

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165243
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<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgacagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165244
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgacagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165245
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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cugagaggcg ccgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165254
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aacagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165256
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165257
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADJ80804

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgacagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 165258
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADJ80814

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccagagccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 165259
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADJ80834

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cagcggcagc 840

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<210> 165260
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADJ80848

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165261
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADJ80858

<400> 165261
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 165262
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccaacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcggcaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165263
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADJ80883

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165264
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADJ80893

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165265
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADJ80910

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165266
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADJ80927

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165267
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165268
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADJ80947

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagggcaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165292
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK21863

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165294
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK21883

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccaaguac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165295
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADK21893

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165296
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK21903

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165297
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK21913

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 165298
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADK21923

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcacc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165299
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK21933

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccaacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165300
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK21943

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165301
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADK21953

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg accacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu gggccaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165302
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK32390

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165303
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK32400

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165304
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK32420

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165305
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK32430

<400> 165305

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165306
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADK32440

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165307
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK32450

<400> 165307
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacgc ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165308
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADK32460

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165309
<211> 1701

<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165310
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hemagglutinin__InfluenzaA__ADK32480

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165311
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADK32490

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165312
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADK32502

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165313
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADK32637

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165314
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADK32647

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165315
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK32657

<400> 165315
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165316
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADK32677

<400> 165316
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165317
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK32687

<400> 165317
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagaac 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165318
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK32697

<400> 165318
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165319
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK32776

<400> 165319
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165320
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33621

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165321
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADK33631

<400> 165321
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggugaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165322
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33641

<400> 165322
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<400> 165323

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ADK33681

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165330
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagca cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165331
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33731

<400> 165331
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165332
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33741

<400> 165332
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165333
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33751

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165334
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADK33761

<400> 165334
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugagc cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165335
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33771

<400> 165335
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165336
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33781

<400> 165336
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165337
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33791

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165338
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33801

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcauc 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaacac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33881

<400> 165346
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165347
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33891

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165348
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33901

<400> 165348
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165349
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33911

<400> 165349
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagggcaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcugaucaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165350
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33931

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165351
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33941

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucguga ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165352
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADK33951

<400> 165352
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagggcaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcugaucaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165353
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK33961

<400> 165353
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 165354
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacaccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165356
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<211> 1701
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agcagcagca ccggcgagau cugcgacaac ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 165358
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADK45443

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 165359
<211> 1701
<212> RNA
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<220>
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<400> 165359

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 165360
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK62683

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165361
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK62693

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcggcagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165362
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADK62703

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cauccccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165363
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcauc 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165364
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<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugggcggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugccugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165365
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucggc 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165366
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADK87287

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165367
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccaccggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 165368
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK87289

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 165369
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK87291

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accugggcaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165370
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcaagcu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaccuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

agcaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165371
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK87295

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcagcc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaagaaaca ucugcaucug a 1701

<210> 165372
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagaugc gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165373
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK87298

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca gcggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaacauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165374
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK87300

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagccugu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucgccccc 900

aacggcagca uccccaacga caagagcuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165375
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcgaca ucugcaucug a 1701

<210> 165376
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK87304

<400> 165376
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcggcug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacggcc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg uuccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165377
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK87306

<400> 165377

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADK87319

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac cgagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuacagaauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165386
<211> 1701
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<213> Artificial Sequence

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag cguguacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgccagcauc ggcaagugca acagcggcug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguuccccga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcccc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg uuccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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<220>
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagaugggc 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165388
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcug caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc accauguggg ccugccagaa gggcaacauc 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcaagcu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugagacac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caccuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcaagcu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cacccccauc ggcaagagca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caagguggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165395
<211> 1701
<212> RNA
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<220>
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<400> 165395

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165396
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165397
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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cagugcagaa ucugcaucug a 1701

<210> 165398
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 165399
<211> 1701

<212> RNA
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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 165400
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADK90199

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165401
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK90200

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau cgccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccgugu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165402
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK90201

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165403
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK90202

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagccccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga cuggagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165404
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK90203

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165405
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK90204

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165406
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADK94191

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

guggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165407
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK94202

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165408
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK94213

<400> 165408
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 165409
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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 165410
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 165411
<211> 1701
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165412
<211> 1701
<212> RNA
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<220>
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165413
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADK94290

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165414
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK94301

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 165415
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK94323

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 165416
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK94441

<400> 165416
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165417
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgcccaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 165418
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 165419
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

guggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165420
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK94509

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acaucaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165421
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK94520

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga gauucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aagugcaaca ucugcaucug a 1701

<210> 165422
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK94531

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 165423
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK94542

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 165424
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADK94553

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcaac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165425
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 165426
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

accaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165427
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK98503

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacguggacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165428
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK98623

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165429
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 165430
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK98645

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 165431
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK98656

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165432
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK98667

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcaac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165433
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucacccag 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 165434
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 165435
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK98700

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165436
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK98711

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165437
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK98722

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaagg gcagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 165438
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK98733

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 165439
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK98744

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 165441
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADK98788

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165442
<211> 1701
<212> RNA
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<220>
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaccuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaaggag 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<212> RNA
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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 165446
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK98843

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 165447
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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guggagcuga agcccggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga gauucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cggccaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcaccaaga gaagccagca gaccgugauc agcaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 165460
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<212> RNA
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 165461
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADK99008

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 165463
<211> 1701
<212> RNA
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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165464
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK99063

<400> 165464
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165465
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 165465
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165466
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADK99096

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165467
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK99107

<400> 165467

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165468
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK99118

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacauc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcaac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165469
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK99129

<400> 165469
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacaugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcaac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165470
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK99140

<400> 165470
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165471
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADK99151

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gccugcagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165474
<211> 1701
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165475
<211> 1701
<212> RNA
<213> Artificial Sequence

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165476
<211> 1701
<212> RNA
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 165477
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADK99217

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 165478
<211> 1701
<212> RNA
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<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 165480
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg acaucgagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 165481
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 165482
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 165483
<211> 1701
<212> RNA
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 165484
<211> 1701
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hemagglutinin__InfluenzaA__ADK99305

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 165485
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 165485

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 165486
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADL28000

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcgagag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165487
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<213> Artificial Sequence

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccagaa gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 165488
<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165489
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165490
<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165491
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADL28055

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165492
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 165493
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 165494
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADL28088

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacagccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165495
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL28099

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165496
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADL28110

<400> 165496
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ggcaacgaca acagcaccgc cacccugugc aucggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165497
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL28126

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugaa ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165498
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL28137

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacggc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165499
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL28148

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165500
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL28170

<400> 165500
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165501
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL28181

<400> 165501
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165502
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL28192

<400> 165502
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

guggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<400> 165503

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165504
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 165505
<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacagccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ccgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 165506
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL28236

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165507
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL28247

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 165508
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL28258

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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<210> 165509
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL28370

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 165510
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL29672

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165511
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL29682

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADL29692

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165513
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hemagglutinin__InfluenzaA__ADL29702

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165514
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165515
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADL29740

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165516
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADL29750

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165517
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL29760

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gugaccguga cccacagcgu gaaccugcug gaguacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165518
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL29770

<400> 165518
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165519
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL29780

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165520
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL29879

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165521
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32017

<400> 165521

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugccag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165522
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32037

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgugg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165523
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32047

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165524
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32057

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcaggg ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165525
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32090

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165526
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL32114

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165527
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL32344

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165528
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL32354

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165529
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32364

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aucagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165530
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32374

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165531
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32384

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165532
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADL32394

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165533
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32404

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165534
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL32414

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagcccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165535
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADL32424

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165536
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL32434

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccauccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggauccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165537
<211> 1701
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165538
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL32454

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165539
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL32464

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165540
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32484

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165541
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32504

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaugug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagca cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165542
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL32514

<400> 165542
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165543
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL32524

<400> 165543
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165544
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL32544

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagaaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165545
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32554

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165546
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32670

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165547
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32690

<400> 165547
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaugug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165548
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32710

<400> 165548
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165549
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32720

<400> 165549
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165550
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADL32730

<400> 165550
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165551
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL32740

<400> 165551
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165552
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39137

<400> 165552
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165553
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39148

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagagacuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 165554
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39159

<400> 165554
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga ucaucgacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucagaagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcuucgcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165555
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADL39170

<400> 165555
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugaccg ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cgugcugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165556
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39203

<400> 165556
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165557
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39214

<400> 165557

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165558
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39225

<400> 165558
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgccagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165559
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39236

<400> 165559
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacaccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc caugggcaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 165560
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39280

<400> 165560
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga gauucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165561
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39291

<400> 165561
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

augggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165562
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39302

<400> 165562
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165563
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39313

<400> 165563
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga gauucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165564
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39335

<400> 165564
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga gauucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucc accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165565
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL39368

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165566
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39390

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccagccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165567
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39401

<400> 165567
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaugag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165568
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADL39412

<400> 165568
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcgagaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165569
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39423

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccagccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 165570
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39434

<400> 165570
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga gauucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165571
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39445

<400> 165571
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccacccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165572
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL39456

<400> 165572
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccagccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165573
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<212> RNA
<213> Artificial Sequence

<220>
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<400> 165573
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165574
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<212> RNA
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hemagglutinin__InfluenzaA__ADL41164

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 165575
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADL41173

<400> 165575

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165576
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADL60242

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccgac 600

aucggcaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165577
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADL60253

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcggccugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165578
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL60264

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccgac 600

aucggcaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165579
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL60275

<400> 165579
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccgac 600

aucggcaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165580
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<212> RNA
<213> Artificial Sequence

<220>
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<400> 165580
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgaggug gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165581
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL60297

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccagaaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacagcc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165582
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL60308

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgugc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165583
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL60341

<400> 165583
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgugc agaaggcccu guaccacacc gagaucgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gaccauccug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 165584
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL60352

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg gcuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccgac 600

aucggcaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 165585
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADL60363

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccauc 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcgu gggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165586
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADL60374

<400> 165586
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acgacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 165587
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM07135

<400> 165587
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165588
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM07144

<400> 165588
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165589
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM07154

<400> 165589
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165590
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM07163

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165591
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM07460

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc caugggcaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 165592
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM07504

<400> 165592
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165593
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM12806

<400> 165593

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165594
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM12817

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165595
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM12828

<400> 165595
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165596
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM12839

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165597
<211> 1701

<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADM12850

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165598
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM12861

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165599
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM12871

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165600
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM12881

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165601
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM12891

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165602
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM12901

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165603
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM12911

<400> 165603
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165604
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165605
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<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165606
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM12941

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165607
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM12951

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165608
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM12961

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugggcggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165609
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM12971

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 165610
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM12981

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165611
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM12991

<400> 165611
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagca cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165612
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM13001

<400> 165612
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165613
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13011

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165614
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13021

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ugcaucggcu accacgccaa caacagcacc gacaccaucg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165615
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13031

<400> 165615
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165616
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13041

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165617
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM13051

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165618
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM13061

<400> 165618
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccagcugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165619
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13071

<400> 165619
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165620
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13081

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagga gaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165621
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13091

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165622
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM13101

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165623
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13111

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggaccccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165624
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM13121

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165625
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM13131

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165626
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM13141

<400> 165626
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165627
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 165627
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165628
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165629
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13171

<400> 165629

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cauccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165630
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM13181

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165631
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM13191

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165632
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13211

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 165633
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13221

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165634
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13231

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165635
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13241

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165636
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13251

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165637
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM13261

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165638
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM13271

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau ccaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165639
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM13281

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165640
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM13291

<400> 165640
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165641
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM13301

<400> 165641
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacguggacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gagaacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugagcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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<211> 1701
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aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaaggac 1560

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<212> RNA
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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 165657
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agcggcuucu ucagcagacu gaacuggcug accaagagcg gcagcaccua ccccgugcug 540

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

aacuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagag aggcaacauc 1680

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<210> 165658
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1695
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agaaucugca ucuga 1695

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<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADM14525

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gccugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggacgug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165661
<211> 1695
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cguggagacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcgg ccacagcugc 1680

agaaucugca ucuga 1695

<210> 165662
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM14562

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

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<212> RNA
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hemagglutinin__InfluenzaA__ADM14571

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 165664
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADM14580

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

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<210> 165665
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<220>
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hemagglutinin__InfluenzaA__ADM14589

<400> 165665

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgugauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 165670
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 165671
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM14664

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<210> 165672
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM14673

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165673
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM14682

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165674
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM14691

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165675
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM14700

<400> 165675
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165676
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM14709

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac caacagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccugaacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcgg ccacagcugc 1680

agaaucugca ucuga 1695

<210> 165677
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM14718

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcaugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165678
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM14728

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaac 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcgg ccacagcugc 1680

agaaucugca ucuga 1695

<210> 165679
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM14737

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165680
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM14746

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug ggugcugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<400> 165683

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

aucagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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hemagglutinin__InfluenzaA__ADM14830

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aaccccgagu gcgagcugcu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<210> 165686
<211> 1695
<212> RNA
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hemagglutinin__InfluenzaA__ADM14848

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 165687
<211> 1695

<212> RNA
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agaaucugca ucuga 1695

<210> 165688
<211> 1695
<212> RNA
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagga gaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagga gaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgugauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccgagagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagga gaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgugauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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agaaucugca ucuga 1695

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<212> RNA
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcagaaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1695
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM14966

<400> 165696
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcgg ccacagcugc 1680

agaaucugca ucuga 1695

<210> 165697
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM14975

<400> 165697
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165698
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM14985

<400> 165698
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagga gaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucguga ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165699
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM23841

<400> 165699
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccagagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165700
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM23843

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165701
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM23844

<400> 165701

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aucagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccagagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165702
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM23845

<400> 165702
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aucagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccagagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165703
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM23846

<400> 165703
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aucagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165704
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM23847

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aucagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccagagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgugggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165705
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__ADM23849

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccagagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165706
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM23851

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccagagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165707
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM23852

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165708
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM23853

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165709
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM23855

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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cagugcagaa ucugcaucug a 1701

<210> 165710
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM23856

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagag aaaggaggug cuggugcugu ggggcaucca ccaccagagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165711
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM25945

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165712
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<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ADM26264

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__ADM26265

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165715
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hemagglutinin__InfluenzaA__ADM26266

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165716
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM26267

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165717
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaga gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 165718
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM26269

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaga gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165719
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM26270

<400> 165719

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcagaugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165720
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM26271

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165721
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADM26272

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcagaugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165722
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM26274

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165723
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM26276

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165724
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM26277

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165725
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM26278

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgugag cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauuc gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaga gagaggagau cgacggcgug 1560

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<210> 165726
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM26279

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165727
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM26280

<400> 165727
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165728
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM26281

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag agcauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagagaaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165729
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM26282

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagagaaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165730
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM26283

<400> 165730
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165731
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM26284

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165732
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM26285

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165733
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM26784

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 165734
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM26795

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagcg ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag aagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<211> 1704
<212> RNA
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

ccccugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaaggacag cuggagcgac 420

cacgaggcca gccugggcgu gagcgccgcc ugcagcuacc agggcaacag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gaaggacuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgag 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca agaucaacgg ccagagcggc 720

agaaucgacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agguggagua cggcaacugc aacaccagau gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

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aagaaccugu acgacaaggu gagacugcag cugaaggaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcaac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caucuaccag auccugagca ucuacagcac cguggccagc 1620

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<212> RNA
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<400> 165737

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165738
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM31488

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165739
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM31498

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug gugaagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165740
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagaagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga gccugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165741
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM31518

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacguga acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165742
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31528

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165743
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM31538

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165744
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM31548

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag guggccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165745
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM31558

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cagaaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165746
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM31568

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165747
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM31578

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165748
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM31588

<400> 165748
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagaccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165749
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31598

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165750
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31608

<400> 165750
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ADM31618

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165752
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165753
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165754
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM31648

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165755
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADM31658

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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<210> 165756
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM31668

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<210> 165757
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM31688

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165758
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31698

<400> 165758
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cauccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cugauccugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165759
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31708

<400> 165759
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165760
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31718

<400> 165760
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165761
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31728

<400> 165761
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ccagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165762
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31738

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccagaagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165763
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31748

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165764
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31758

<400> 165764
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgaccccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165765
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31768

<400> 165765
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165766
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM31778

<400> 165766
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165767
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31798

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165768
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM31808

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugcugug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug gugggccccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165769
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM31818

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165770
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31828

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaga gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165771
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM31838

<400> 165771
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaga gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165772
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31848

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165773
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31858

<400> 165773

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

gagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165774
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM31868

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucagca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165775
<211> 1701
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165777
<211> 1701

<212> RNA
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165778
<211> 1701
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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg accacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165779
<211> 1701
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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcaucug a 1701

<210> 165780
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADM31928

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165781
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31948

<400> 165781
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165782
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31958

<400> 165782
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165783
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31968

<400> 165783
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165784
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM31978

<400> 165784
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165785
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM31998

<400> 165785
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165786
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM32008

<400> 165786
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165787
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM32018

<400> 165787
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165788
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM32028

<400> 165788
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165789
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hemagglutinin__InfluenzaA__ADM32038

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<212> RNA
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<220>
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165791
<211> 1701
<212> RNA
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<220>
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<400> 165791

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165792
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM32068

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 165793
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165794
<211> 1701
<212> RNA
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<220>
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 165795
<211> 1701

<212> RNA
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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cagugcagaa ucugcaucug a 1701

<210> 165796
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM32108

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165797
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM32551

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165798
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165799
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM32571

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165800
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM32581

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165801
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM32591

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165802
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM32601

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165803
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM32611

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165804
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM32621

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165805
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM32631

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaacc uguaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165806
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<212> RNA
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hemagglutinin__InfluenzaA__ADM32641

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165807
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM32651

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165808
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM32661

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaacg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165809
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM32671

<400> 165809

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 165810
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM32681

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcaucug a 1701

<210> 165811
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM32691

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165812
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM32701

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 165813
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__ADM32711

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165814
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM32721

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165815
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM32741

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165816
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM32751

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165817
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM32761

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 165818
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM32771

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcgag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165819
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM32781

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagcuu ccccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165820
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<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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gugaccguga cccacagcgu gaacauccug gagaacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165822
<211> 1701
<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165823
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165824
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM32831

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165825
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM32841

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165826
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM32851

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165827
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM32861

<400> 165827

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165828
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ADM32929

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165831
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__ADM32939

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165832
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hemagglutinin__InfluenzaA__ADM32949

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agaugcagaa ucugcaucug a 1701

<210> 165833
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cguggagagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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agaugcagaa ucugcaucug a 1701

<210> 165834
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hemagglutinin__InfluenzaA__ADM32977

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agaugcagaa ucugcaucug a 1701

<210> 165835
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM32986

<400> 165835
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac caacagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac ggcaucacca acaagaucaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccugaacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165836
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM32995

<400> 165836
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac caacagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac ggcaucacca acaagaucaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165837
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM33004

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165838
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM33023

<400> 165838
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165839
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM33040

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165840
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33050

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165841
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM33069

<400> 165841
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165842
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM33079

<400> 165842
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165843
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33099

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugauggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165844
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33109

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugauggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165845
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33128

<400> 165845

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165846
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM33137

<400> 165846
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165847
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33147

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165848
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM33157

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agaugcagaa ucugcaucug a 1701

<210> 165849
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM33167

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165850
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM33177

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165851
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33186

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165852
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADM33195

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165853
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33204

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165854
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33222

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165855
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33232

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165856
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM33241

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucaccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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agaugcagaa ucugcaucug a 1701

<210> 165857
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33251

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165858
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33260

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacacc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

agaugcagaa ucugcaucug a 1701

<210> 165859
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM33280

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgug agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165860
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165861
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165862
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33310

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165863
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33320

<400> 165863

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccuuc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165864
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33340

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 165865
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADM33355

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 165866
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<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33365

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 165867
<211> 1701

<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165868
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gaccagcaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165869
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADM33395

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165870
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM33405

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165871
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADM33415

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165872
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM33425

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165873
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM34007

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug gaggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165874
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 165874
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165875
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADM52453

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165876
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM52473

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugcugug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug gugggccccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165877
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM52483

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165878
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM52493

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165879
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cagugcagaa ucugcaucug a 1701

<210> 165880
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM52524

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165881
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM52534

<400> 165881

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 165882
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM52554

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165885
<211> 1701

<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165886
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM52594

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165887
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM52604

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165888
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM52614

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 165889
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM52624

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165890
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM52634

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165891
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM52644

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165892
<211> 1701
<212> RNA
<213> Artificial Sequence

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165893
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM52664

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165894
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADM52674

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165895
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM52684

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165896
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM52704

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165897
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<220>
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<400> 165897
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165898
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADM86399

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165899
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM86409

<400> 165899

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165900
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165901
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM86440

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165902
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADM86450

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cagugcagaa ucugcaucug a 1701

<210> 165903
<211> 1707

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95450

<400> 165903
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

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cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggcccagc 420

cacgaggcca gccugggcgu gagcgccgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

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ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

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<210> 165904
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95745

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165905
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95746

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165906
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95747

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165907
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95749

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165908
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95750

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcuu caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcagca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165909
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95751

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165910
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM95752

<400> 165910
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165911
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95753

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165912
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95754

<400> 165912
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165913
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<220>
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hemagglutinin__InfluenzaA__ADM95755

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ADM95757

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165916
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<212> RNA
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hemagglutinin__InfluenzaA__ADM95759

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgacu acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165917
<211> 1701
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hemagglutinin__InfluenzaA__ADM95760

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165918
<211> 1701
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hemagglutinin__InfluenzaA__ADM95761

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 165919
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ADM95763

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gugaccguga cccacagcgu gaaccugcug gaggacaaga acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165920
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM95764

<400> 165920
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165921
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95765

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165922
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95767

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165923
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95768

<400> 165923
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165924
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95769

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165925
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95771

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165926
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95772

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165927
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95774

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165928
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<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADM95776

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165930
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADM95778

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 165931
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ADM95779

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggagc ccaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165932
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM95780

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165933
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165934
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADM95784

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165935
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95785

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165936
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95786

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165937
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95788

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165938
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95789

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165939
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95790

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagaaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165940
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95791

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagaaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165941
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95792

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagaaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165942
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95793

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165943
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95794

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165944
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95795

<400> 165944
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165945
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95798

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165946
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cgagaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165947
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95800

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggcccccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165948
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95801

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165949
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95802

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165950
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95803

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagaac 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<212> RNA
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<400> 165953

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM95809

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165955
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95810

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 165956
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 165957
<211> 1701

<212> RNA
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<220>
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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 165958
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ADM95819

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165959
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95820

<400> 165959
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165960
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95821

<400> 165960
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165961
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95822

<400> 165961
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165962
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95823

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165963
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95824

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165964
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM95825

<400> 165964
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165965
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95826

<400> 165965
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165966
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95827

<400> 165966
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagca cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165967
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95828

<400> 165967
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165968
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95829

<400> 165968
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165969
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM95831

<400> 165969
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165970
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95832

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165971
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95833

<400> 165971

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165972
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM95834

<400> 165972
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165973
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95836

<400> 165973
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165974
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95837

<400> 165974
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165975
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM95838

<400> 165975
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ugcacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165976
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADM95839

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165977
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM95840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165978
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95842

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165979
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95843

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165980
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95844

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165981
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95845

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagacc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165982
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADM95846

<400> 165982
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggaggccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165983
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95847

<400> 165983
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165984
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95848

<400> 165984
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165985
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95849

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg ugaucagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165986
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95850

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165987
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95851

<400> 165987
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165988
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95852

<400> 165988
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaagaucag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165989
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADM95854

<400> 165989

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 165990
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM95855

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165991
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM95857

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aacagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165992
<211> 1701
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<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165993
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__ADM95859

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacgagaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165994
<211> 1701
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hemagglutinin__InfluenzaA__ADM95860

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165995
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADM95862

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 165996
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADM95864

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccagagu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 165997
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaucagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggg cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

augguggacc agagaacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166005
<211> 1701
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<400> 166005
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166006
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN78194

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggccugcugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166007
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADN78195

<400> 166007

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166008
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADN78212

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166009
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN78221

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166010
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN89050

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggg cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 166011
<211> 1698

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADN89061

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166012
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN89072

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

auggccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaagggcaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggg cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 166020
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<212> RNA
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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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hemagglutinin__InfluenzaA__ADN89226

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<211> 1698
<212> RNA
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hemagglutinin__InfluenzaA__ADN89248

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cugaagggca ucgccccccu gcagcugggc aacugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

auggccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89292

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166029
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89303

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166030
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89314

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166031
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89325

<400> 166031
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166032
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89336

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccgac 600

aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166033
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN89347

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166034
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89358

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 166035
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89369

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccgac 600

aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag aagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugaaggag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 166039
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggg cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166040
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 166041
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<212> RNA
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hemagglutinin__InfluenzaA__ADN89435

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

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gacuacccca aguacagcga ggagagcaga cugaacagag agaagaucga cggcgugaag 1560

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<210> 166042
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<212> RNA
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hemagglutinin__InfluenzaA__ADN89446

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 166043
<211> 1698
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADN89457

<400> 166043

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucaacgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca gcaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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<212> RNA
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hemagglutinin__InfluenzaA__ADN89501

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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hemagglutinin__InfluenzaA__ADN89512

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

auggccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

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aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaga cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggg cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug cugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
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hemagglutinin__InfluenzaA__ADN89611

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 166058
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<212> RNA
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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaga cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<400> 166061

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaga cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

auggccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 166064
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<212> RNA
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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

auggccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 166065
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<212> RNA
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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

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aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166066
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<212> RNA
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hemagglutinin__InfluenzaA__ADN89710

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166071
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hemagglutinin__InfluenzaA__ADN89776

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 166072
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

auggccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166073
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89809

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166075
<211> 1698
<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166076
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN89831

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166077
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89842

<400> 166077
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagac acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166078
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN89864

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166079
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 166079

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 166080
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89886

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 166081
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89897

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166082
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89908

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166083
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN89919

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166084
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN89930

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166085
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN89941

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166086
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89952

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166087
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89963

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166088
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89974

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166089
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN89985

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166090
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 166090
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166091
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN90007

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166092
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166093
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN90040

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166094
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN90051

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166095
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADN90062

<400> 166095
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166096
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN90073

<400> 166096
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166097
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN90084

<400> 166097

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166098
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166099
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN90106

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166100
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166101
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN90128

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166102
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN90139

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166103
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN90150

<400> 166103
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166104
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN90161

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166105
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADN90172

<400> 166105
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166106
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN90183

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166107
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN90194

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166108
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166109
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN90216

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166110
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN92467

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccaggcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166111
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN92478

<400> 166111
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccaggcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 166112
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN92489

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccaggcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166113
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADN92500

<400> 166113
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccaggcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN92520

<400> 166115

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166116
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADN92530

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166117
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADN92540

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166118
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 166119
<211> 1701

<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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<210> 166120
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADO00730

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcggcagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166121
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO00740

<400> 166121
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagca cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166122
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO00750

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166123
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO12143

<400> 166123
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166124
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO12153

<400> 166124
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166125
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADO12163

<400> 166125
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166126
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADO12173

<400> 166126
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166127
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO12183

<400> 166127
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166128
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO12193

<400> 166128
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 166129
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADO12203

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__ADO12213

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166131
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166132
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADO12233

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO12243

<400> 166133

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166134
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO12253

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 166135
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO12263

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166136
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO12273

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<220>
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hemagglutinin__InfluenzaA__ADO12293

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<220>
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hemagglutinin__InfluenzaA__ADO12313

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 166141
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADO12323

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 166142
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADO12333

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<220>
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hemagglutinin__InfluenzaA__ADO12343

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<211> 1701
<212> RNA
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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acaacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166152
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO12443

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166153
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO12453

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166154
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO12463

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166155
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO12473

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc agaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166156
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO12493

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166157
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO12503

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc aacuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166158
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO12513

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagagagg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166159
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO12523

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166160
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO12533

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac cagacugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166161
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO12543

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166162
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADO12553

<400> 166162
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166163
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO12563

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166164
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO12573

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166165
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO12593

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166166
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO12603

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166167
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO12613

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166168
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO12623

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ADO14349

<400> 166169

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaagggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca agggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166170
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<212> RNA
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hemagglutinin__InfluenzaA__ADO14351

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 166171
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO14353

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccga ggccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 166172
<211> 1701
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<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADO14354

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 166173
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADO14356

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

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<210> 166174
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADO14357

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 166175
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO14359

<400> 166175
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166176
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO14361

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca agggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166177
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO14362

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

aacagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166178
<211> 1683
<212> RNA
<213> Artificial Sequence

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gccaccaacc ugggccaccc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccgg caccaucugg 420

aacgugagcu acggcggcac cagcaaggcc ugcagcgaca gcuucuacaa gagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc auccaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc agcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc acaacgugag caaguacgcc uucggcaacu gccccaagua cgugggcgug 960

aagagccuga agcuggccgu gggccugaga aacgugcccg ccagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

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aaggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 166179
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO21026

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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccgg caccaucugg 420

aacgugagcu acggcggcac cagcaaggcc ugcagcgaca gcuucuacaa gagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc auccaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaaccccc ugaucggccc cagaccccug gugaacggcc agcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc acaacgugag caaguacgcc uucggcaacu gccccaagua cgugggcgug 960

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aaggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

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<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccgg caccaucugg 420

aacgugagcu acggcggcac cagcaaggcc ugcagcgaca gcuucuacaa gagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc auccaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccu acaucggccc cagaccccug gugaacggcc agcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

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aaggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 166181
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO21048

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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

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aacgugagcu acggcggcac cagcaaggcc ugcagcgaca gcuucuacaa gagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc auccaggacg cccaguacac caacaacaga 540

ggcaagaaca uccacuucau gugggcauc aaccaccccc ccaccgacac cacccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc agcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

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uga 1683

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO25092

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaac 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166183
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO25112

<400> 166183
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166184
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO25122

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166185
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO25132

<400> 166185
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acacccugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

gacaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166186
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO25142

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166187
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO25152

<400> 166187

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagccu guucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166188
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO25162

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166189
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO25172

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166190
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO25182

<400> 166190
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166191
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO25192

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 166192
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO25202

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166193
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO25212

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagag aaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166194
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO25222

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166195
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO25232

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166196
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO25242

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166197
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO25252

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166198
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADO25262

<400> 166198
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADO25272

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgugaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 166201
<211> 1698
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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hemagglutinin__InfluenzaA__ADO29887

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166203
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADO29888

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaga 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166204
<211> 1701
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hemagglutinin__InfluenzaA__ADO29889

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<210> 166205
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADO29890

<400> 166205

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166206
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO29891

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagac caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugagcga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166207
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO29892

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcag aauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgugg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__ADO29893

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166209
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__ADO29894

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcagca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166210
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADO29895

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcagca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166211
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADO29897

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaagug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccag acugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 166212
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADO29898

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<210> 166213
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADO29899

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ccugcaucug a 1701

<210> 166214
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO29900

<400> 166214
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gaccugaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accugaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaagag caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugagaagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucugggc cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166215
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO29901

<400> 166215
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacgagaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggccaag aagggcaaca gcuaccccaa ggugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcuucaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166216
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADO29902

<400> 166216
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agggcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166217
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO29903

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ccgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166218
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO29904

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc agaugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca cagacccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gggcgaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcaacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166219
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO29905

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gugaccguga ccagaagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcaacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166220
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO29906

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacagaaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166221
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO29907

<400> 166221
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaagcu gaagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166222
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADO29908

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gaguggagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaccu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 166223
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO29909

<400> 166223

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166224
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO29910

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cccagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaucggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gaggcgagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166225
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO30407

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagccu guucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166226
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO30417

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcaucug a 1701

<210> 166227
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO33202

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 166228
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO33240

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 166229
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO33247

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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hemagglutinin__InfluenzaA__ADO33313

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166238
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO33329

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO33337

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166240
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO33345

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166241
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADO33352

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166242
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166243
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO33368

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166244
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADO33376

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcaccgaca aguggaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagagaagaa ugaacuacua cuggacccug gugcagcccg gcgacaagau caccuuccag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcaccgaca aguggaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

cccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcacccacg aguggaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgugggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcaccgaca aguggaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcaccgaca aguggaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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agcaccgaca aguggaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcaccgaca aguggaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccuuc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADP95341

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 166258
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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<210> 166259
<211> 1701
<212> RNA
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<400> 166259

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<210> 166260
<211> 1701
<212> RNA
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cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<212> RNA
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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 166280
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 166281
<211> 1701

<212> RNA
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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 166282
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<210> 166283
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADQ28029

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166288
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaga 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 166289
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADQ28036

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 166291
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgacgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166299
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADQ28048

<400> 166299
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166300
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADQ28049

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166301
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADQ28050

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166302
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADQ28051

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166303
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADQ28053

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166304
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADQ28055

<400> 166304
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166305
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADQ28056

<400> 166305
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166306
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADQ28057

<400> 166306
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166307
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADQ28058

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166308
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADQ28059

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166309
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADQ28060

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166310
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADQ28061

<400> 166310
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cugagaggcg uggccccccu gcaccugggc agaugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccaacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166311
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADQ28063

<400> 166311
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacca cuggacccug gugaagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgccg uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166312
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADQ28064

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166313
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADQ28065

<400> 166313

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg gccagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccaggugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166314
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADQ28066

<400> 166314
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccagagu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166315
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166316
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<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgagaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug gugaagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__ADQ28069

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166318
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADQ28070

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166319
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADQ28071

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166320
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADR32361

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaugcaaca ucugcaucug a 1701

<210> 166321
<211> 1689
<212> RNA
<213> Artificial Sequence

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<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADT78887

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gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

aaguacagcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugauc 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacggcug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

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acccaguucg aggccguggg caaggaguuc agcaaccugg agaagagacu ggagaaccug 1260

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augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

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<210> 166322
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
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<400> 166322
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca aggccccccu gcagcugggc aagugcaaca ucgccggcug ggugcugggc 240

aaccccgagu gcgagagccu gcugagcaac agaagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc gacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaagcaca acaccaccag aggcgugacc gccgccugca gccacgccag aaagagcagc 480

uucuacaaga accuggugug gcugaccgag gccaacggca gcuaccccaa ccugagcaag 540

agcuacguga acaaccagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucgagg accagagaac ccuguacaga aaggacaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccaaga gacccaaggu gagagaccag 720

cccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaccggca accugaucgc ccccugguac gccuucgccc ugagcagagg ccccggcagc 840

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ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

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cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gcugagcaag agaagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc gacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaagcaca acaucaccag aggcgugacc gccgccugca gccacgccgg caagagcagc 480

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aacaucgagg accagaagac ccuguacaga aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

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cugaagggca aggccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gcugagcaag agaagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc gacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaagcaca acaccaccag aggcgugacc gccgccugca gccacgccag aaagagcagc 480

uucuacaaga accugcugug gcugaccgag gccaacggca gcuaccccaa ccugagcaag 540

agcuacguga acaaccagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucgagg accagagaac ccuguacaga aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagaaaccag 720

gccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg ccugggcagc 840

ggcaucauca ccagcaacgc cagcauggac gagugcgaca ccaagugcca gacccccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

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ggcauccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca agaacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

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aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggugaucuac gccaccgugg ccggcagccu gagccuggcc 1620

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<212> RNA
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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166330
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADT79108

<400> 166330
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gcugagcaac agaagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc gacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaagcaca acaucaccag aggcgugacc gccgccugca gccacgccaa gaagagcagc 480

uucuacaaga accugcugug gcugaccgag gccaacggca gcuaccccaa ccugaucaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucgagg accagagaac ccuguacaga aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaagau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg ccugggcagc 840

ggcaucauca ccagcaacgc cagcauggac gagugcgaca ccaagugcca gacccccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccagaaga gcacccagaa cgccaucaac ggcaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaacaagcu ggagaagaga 1260

auggagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugaa gaaccagcug agaaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166331
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADT79119

<400> 166331

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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggcagcaac uaccccgugg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgagaccgag 600

cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca cccccgacau cgccaccaga cccaagguga acggccuggg cggcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccugggcaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 166332
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADT79129

<400> 166332
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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

augaucuggc ugaccaagaa gggcagcaac uaccccgugg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgagaccgag 600

cagagaaccc uguaccagaa cgugggcacc uacgugagcg uggugaccag cacccugaac 660

aagagaagca cccccaagau cgccaccaga cccaagguga acggccuggg cggcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cuggccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagagag ccuucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 166333
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADT79232

<400> 166333
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacaagcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gacgugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166334
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADT79242

<400> 166334
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166335
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADT91182

<400> 166335
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagccccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166336
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADU20561

<400> 166336
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugggcggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166337
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADU20562

<400> 166337
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaga ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166338
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<220>
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gugaccguga cccacagcgu gaaccugcug gagagcagcc acaacggcaa gcugugcagc 180

cugaacggca aggccccccu gcagcugggc aacugcaacg uggccggcug gauccugggc 240

aaccccgagu gcgaccugcu gcugaccgug aacagcugga gcuacaucau cgagaccagc 300

accagcaaga acggcgccug cuaccccggc gaguucgccg acuacgagga gcugagagag 360

cagcugagca ccgugagcag cuucgagaga uucgagaucu uccccaaggc caccagcugg 420

cccaaccacg agaccaccaa gggcaccacc guggccugca gccacagcgg cgccaacagc 480

uucuacagaa accugcugug gaucgugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacacca acaacaaggg caaggaggug cuggugaucu ggggcgugca ccacccccc 600

accgacagcg accagcagac ccuguaccag aacaaccaca ccuacgugag cgugggcagc 660

agcaaguacu accagagauu cacccccgag aucgugacca gacccaaggu gagagagcag 720

gccggcagaa ugaacuacua cuggacccug cuggaccagg gcgacaccau caccuucgag 780

gccaccggca accugaucgc ccccuggcac gccuucgccc ugaacaaggg cagcagcagc 840

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ggcgcccuga agagcaaccu gcccuuccag aacgugcacc ccaucaccau cggcgagugc 960

cccaaguacg ugaagagcac ccagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acgugcaguu caccagcgug ggcaaggagu ucaacaaccu ggagaagaga 1260

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uacaacuacc ccagauacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcgugggcgu gcaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166339
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166340
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166341
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166342
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 166343
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADU59612

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 166344
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166345
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADU59769

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggaggccagc 300

agcagcaaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<210> 166360
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<212> RNA
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hemagglutinin__InfluenzaA__ADU76768

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166362
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADU76769

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166363
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166364
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ADU76771

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166365
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADU76772

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 166366
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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<210> 166367
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 166367

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 166368
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADU76776

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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hemagglutinin__InfluenzaA__ADU76777

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166371
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166373
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADU76781

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166374
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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<210> 166375
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 166376
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 166382
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<211> 1701
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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__ADU76793

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg caccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 166385
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADU85911

<400> 166385

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gugaccguga cccacagcgu gaaccugcug gagaacaagc acaacggcaa gcugugcaag 180

cugggcggca ucgccccccu gcaccugggc aagugcgaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu guucaccgcc agcagcugga gcuacaucgu ggagaccccc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

caccugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc caacagcugg 420

cccaaccacg acaccaacaa gggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaagaa gaaggaggug cuggugaucu ggggcaucca ccacccccc 600

accagcaccg accagcagac ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagagauu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa uggacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaagagagg cagcggcagc 840

ggcaucaucg ugagcgacgc ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuucc uggagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcgccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166387
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADV17293

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 166388
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 166389
<211> 1701

<212> RNA
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cagugcagaa ucugcaucug a 1701

<210> 166390
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADV17323

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 166391
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADV17333

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagaa ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcugagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cugaagggca ucgccccccu gcagcugggc aacugcaacg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

gaccccgaga acggcaccug cuaccccggc uacuucaccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

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cacuacagca gaagauucac ccccgagauc gugaagagac ccaaggugag agaccaggag 720

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aucggcgacc agagaacccu guaccacacc gagaacgccu acgugagcgu gaugagcagc 660

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uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag aagagcugga gcuacaucgu ggagaccccc 300

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cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgccgccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugaucuggcu gaccaugaag aacggccugu accccaaccu gagaaagagc 540

uacgagaacg acaaggagaa ggaggugcug auccuguggg gcgugcacca ccccccccaac 600

aucgagaacc agagaacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagcg gcagauucac ccccgagauc accaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcaacg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc uacuucaccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaagcu gagcaagagc 540

uacaccaacg acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucagagacc agagaacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gugaagagac ccaaggugag agaccaggag 720

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aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aaccccgagu gcgagcugcu gaucagcaag aagagcugga gcuacaucgu ggagaccccc 300

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aucggcgacc agagaacccu guaccacacc gagaacgccu acgugagcgu gaugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag aagagcugga gcuacaucgu ggagaccccc 300

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cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca acgugaacgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

cugggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcaacg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucaccg acuacgagga gcugagagag 360

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aucggcgacc agagagcccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gugaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcaacg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucaccg acuacgagga gcugagagag 360

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aucggcgacc agagagcccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua caacauccug gccaucuaca gcaccguggc cagcagccug 1620

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cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcagc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacaccaaca agaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccagcaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag aaaccaggag 720

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

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gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag aagagcugga gcuacaucgu ggagaccccc 300

aaccccggca acggcgccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

agcaaccaca acgugaacgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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uacgccaacg acaaggagaa ggaggugcug auccuguggg gcgugcacca ccccagcaac 600

aucggcgacc agagaacccu guaccacacc gagaacgccu acgugagcgu gaugagcagc 660

cacuacagca gaagauucac ccccgagauc agcaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac auccaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cagcgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cccaaccaca ccgugaccgg cgugagcagc agcugcagcc acaacggcaa cagcagcuuc 480

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uacaccaaca agaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccagcaac 600

aucgaggacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucaa ccccgagauc gccaagagac ccaaggugag aaaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cccaaccaca ccgugaccgg cgugagcagc agcugcagcc acaacggcaa cagcagcuuc 480

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aucgaggacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucaa ccccgagauc gccaagagac ccaaggugag aaaccaggag 720

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gugaacggcu gguacggcua ccaccaccac aacgagcagg gcagcggcua cgccgccaac 1140

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag aagagcugga gcuacaucgu ggagaccccc 300

aagcccgaga acggcaccug cuaccccggc gaguucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgccgccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

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aucgagaacc agagaacccu guaccacacc gagaacaccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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aaccccgagu gcgagagccu gaucagcaag aagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcgccug cuaccccggc gaguucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgccaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

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uacgagaacg acaaggagaa ggaggugcug auccuguggg gcgugcacca cccccccaac 600

aucgagaacc agagaacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 166421
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<212> RNA
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cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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hemagglutinin__InfluenzaA__ADV69103

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aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag aagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcgccug cuaccccggc gaguucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgccaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugaucuggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgagaacg acaaggagaa ggaggugcug auccuguggg gcgugcacca ccccccccaac 600

aucgagaacc agagaacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagcg gcagauucac ccccgagauc accaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag aagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcgccug cuaccccggc gaguucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgccgccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugaucuggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacaagaacg acaaggagaa ggaggugcug aucaucuggg gcgugcacca cccccccaac 600

aucgagaacc agagaacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagcg gcagauucac ccccgagauc accaagagac ccaaggugag agaccaggag 720

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag aagagcugga gcuacaucgu ggagaccccc 300

aaccccggca acggcgccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagga gagcagcugg 420

cccaaccaca acgugaacgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccagaaag aacggccugu accccaaccu gaccaagagc 540

uacgccaaca acaacgacaa ggaggugcug auccuguggg gcgugcacca ccccagcaac 600

aucggcgacc agagaacccu guaccacacc gagaacgccu acgugagcgu gaugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aacagcgaca acggcgccug cuaccccggc caguucaccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugaucuggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgagaacg acaaggagaa ggaggugcug auccuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagaacccu guaccacacc gagaacgccu acaucagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<212> RNA
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hemagglutinin__InfluenzaA__ADV69108

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aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 166428
<211> 1698
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADV69109

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag aagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcgccug cuaccccggc gaguucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgccaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

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uacgagaacg acaagaagaa ggaggugcug auccuguggg gcgugcacca cccccccaac 600

aucgagaacc agagaacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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<210> 166429
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADV76579

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 166430
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADV76587

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 166434
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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaugguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cacccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaagg ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 166435
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ADV76642

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 166436
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADV76664

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ggcaacgaca acagaaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 166437
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADV76673

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ggccugagca gcagaaucag caucuacugg accaucguga accccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 166438
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADV76682

<400> 166438
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcgag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166441
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<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166442
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc aagagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166443
<211> 1701

<212> RNA
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caagaaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 166444
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADV91010

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166445
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW01407

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugcagc 180

cugaacggca agauccccu gcagcugggc aacugcaacg uggccggcug gauccugggc 240

aaccccaagu gcgaccugcu gcugaccgcc aacagcugga gcuacaucau cgagaccagc 300

aacagcaaga acggcgccug cuaccccggc gaguucgccg acuacgagga gcugaaggag 360

cagcugagca ccgugagcag cuucgagaga uucgagaucu uccccaaggc caccagcugg 420

cccaaccacg acaccaccag aggcaccacc guggccugca gccacagcgg cgccaacagc 480

uucuacagaa accugcugug gaucgugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacacca acaacaaggg caaggaggug cuggugaucu ggggcgugca ccaccccccc 600

accgacagcg accagcagac ccuguaccag aacaaccaca ccuacgugag cgugggcagc 660

agcaaguacu acaagagacu gacccccgag aucguggcca gacccaaggu gagagagcag 720

gccggcagaa ugaacuacua cuggacccug cuggaccagg gcgacaccau caccuucgag 780

gccaccggca accugaucgc ccccuggcac gccuucgccc ugaagaaggg cagcagcagc 840

ggcaucauga gaagcgacgc ccaggugcac aacugcacca ccaagugcca gacccccccac 900

ggcgcccuga agggcaaccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac ccagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacaacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaugggcau ccaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagag ugugcaucug a 1701

<210> 166446
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW09101

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166447
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADW09111

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgaccagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166448
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADW09120

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166449
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW09131

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166450
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADW09153

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac ccccagaggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccaggacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166451
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADW09164

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166452
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADW09186

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166453
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADW09197

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166454
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW09208

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac ccccagaggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166455
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<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 166456
<211> 1698
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADW09230

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 166457
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW09241

<400> 166457

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gaugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 166458
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW09252

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166459
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADW09274

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagccc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166460
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW09285

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166461
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADW09296

<400> 166461
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166462
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW09307

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166465
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166466
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<212> RNA
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hemagglutinin__InfluenzaA__ADW10505

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166467
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW10516

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 166468
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADW10527

<400> 166468
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166469
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADW10538

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu gaugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 166470
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW10549

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166471
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<212> RNA
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hemagglutinin__InfluenzaA__ADW10560

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccguguu cgagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccgac 600

aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166472
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW10571

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

auggccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166473
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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<400> 166473
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166474
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW10593

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 166475
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADW10604

<400> 166475

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 166476
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADW10615

<400> 166476
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agagaacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag aaaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacaccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166480
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166481
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hemagglutinin__InfluenzaA__ADW10765

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag aaaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166482
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<212> RNA
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hemagglutinin__InfluenzaA__ADW10776

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaacg acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166483
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<212> RNA
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hemagglutinin__InfluenzaA__ADW10787

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 166484
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<212> RNA
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hemagglutinin__InfluenzaA__ADW10798

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag aaaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166488
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hemagglutinin__InfluenzaA__ADW10842

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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hemagglutinin__InfluenzaA__ADW10853

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

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aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 166490
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<212> RNA
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hemagglutinin__InfluenzaA__ADW10864

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

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aucguggacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 166491
<211> 1698
<212> RNA
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hemagglutinin__InfluenzaA__ADW10875

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucguggacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166492
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW10886

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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<210> 166493
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW10897

<400> 166493

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagguggg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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<210> 166494
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADW23115

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 166495
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADW54481

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166496
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW54512

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166497
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW54527

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 166498
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADW65825

<400> 166498
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166499
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADW82135

<400> 166499
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua caccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166500
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW82155

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

guggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua caccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166501
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW82166

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

guggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua caccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166502
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW82177

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

guggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua caccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166503
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW82188

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166504
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166505
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADW82208

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166506
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADW82218

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166507
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADW82228

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166508
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADW82238

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166510
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hemagglutinin__InfluenzaA__ADW82258

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166511
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADW82268

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau ccaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166512
<211> 1701
<212> RNA
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<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 166513
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 166514
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADW95332

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 166515
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX21078

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

guggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua caccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucagaaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166516
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX21088

<400> 166516
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

guggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua caccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucagaaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166517
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX21098

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcagca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau ccaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166518
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX36109

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166519
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96278

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166520
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96288

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166521
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96298

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgugauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcac cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166522
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADX96308

<400> 166522
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166523
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96318

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166524
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96328

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugge ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166525
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96347

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166526
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96357

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgugauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166527
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96367

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgugauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166528
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96378

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166529
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96398

<400> 166529

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166530
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96408

<400> 166530
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADX96427

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166532
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<212> RNA
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hemagglutinin__InfluenzaA__ADX96437

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

cuggagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166533
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166534
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADX96497

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166535
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADX96507

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166536
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96517

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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<210> 166537
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96527

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166538
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADX96537

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166539
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96547

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166540
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166541
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96587

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166542
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96597

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166543
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96607

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166544
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96627

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166545
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADX96637

<400> 166545
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166546
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96647

<400> 166546
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166547
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96657

<400> 166547

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166548
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96667

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166549
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96677

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggaccgug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166550
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96687

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccguguac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166551
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96697

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166552
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96707

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcgaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcac cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166553
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96727

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166554
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96737

<400> 166554
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gaaggagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa ggccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg ugaucagccu gggcgccauc agcuucugga ugugcagcac cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166555
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96747

<400> 166555
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166556
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96757

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggugcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcac cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166557
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96767

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagagcg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcac cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166558
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADX96777

<400> 166558
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggugcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166559
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96787

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166560
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96797

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166561
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96807

<400> 166561
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauuca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166562
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96817

<400> 166562
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166563
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADX96837

<400> 166563
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccuacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcac cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166564
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96847

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166565
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96857

<400> 166565

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166566
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96867

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166567
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96877

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgugauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166568
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96897

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166569
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96907

<400> 166569
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acagcggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcagcaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166570
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADX96927

<400> 166570
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acacccugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggacagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166571
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<212> RNA
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hemagglutinin__InfluenzaA__ADX96937

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166572
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADX96947

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166573
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ADX96957

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166574
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX96967

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166575
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96977

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166576
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADX96987

<400> 166576
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcauc 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166577
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX96997

<400> 166577
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166578
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX97007

<400> 166578
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacgc ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166579
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX97018

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166580
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX97028

<400> 166580
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag cagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166581
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADX98640

<400> 166581
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucagcaac 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166582
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98650

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166583
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98665

<400> 166583

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166584
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98675

<400> 166584
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166585
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX98695

<400> 166585
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166586
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98729

<400> 166586
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166587
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98739

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166588
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98748

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcggcagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166589
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX98758

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166590
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98767

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166591
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98777

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166592
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98785

<400> 166592
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cggcggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166593
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98792

<400> 166593
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166594
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADX98806

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166595
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX98818

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagagaaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaga gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166596
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98828

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166597
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98843

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcggcagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166598
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98853

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaucgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166599
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98860

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166600
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADX98870

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166601
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX98880

<400> 166601

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166602
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX98890

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccgagagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166603
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX98900

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166604
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX98910

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aucagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166605
<211> 1701

<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166606
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX98930

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166607
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX98940

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug gugggccccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166608
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX98950

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagggcaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcugaucaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166609
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX98960

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166610
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX98970

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcaggg ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166611
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ADX98980

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166612
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166613
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADX99000

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166614
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX99581

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aucgacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166615
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADX99592

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

aucgacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aagggcagcu accccaagcu gaagaacagc 540

uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<212> RNA
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hemagglutinin__InfluenzaA__ADX99625

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucggcgcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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<212> RNA
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<400> 166619

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166620
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 166621
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<212> RNA
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hemagglutinin__InfluenzaA__ADX99680

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aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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<212> RNA
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hemagglutinin__InfluenzaA__ADX99702

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cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 166623
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<212> RNA
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<400> 166623
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca ccccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagaa gcaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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<210> 166627
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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<212> RNA
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<210> 166630
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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aacuacaaca gaagauucac ccccgagauc gccggcagac ccaaggugag agaccaggcc 720

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gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacagaugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

cuggagagca ugggcaucua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaagcaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gagcagcuuc 480

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uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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<212> RNA
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

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aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccaagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca ccccccccaac 600

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aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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<210> 166634
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca ccccccccaac 600

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aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga aguacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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<210> 166635
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gagcagcuuc 480

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uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

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aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166636
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<212> RNA
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hemagglutinin__InfluenzaA__ADY00020

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

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gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

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<210> 166637
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<212> RNA
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<220>
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<400> 166637

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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<210> 166638
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ADY11836

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

auggccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADZ53123

<400> 166654
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166655
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADZ53125

<400> 166655

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166656
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ADZ53127

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166657
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADZ53131

<400> 166657
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166658
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADZ53133

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166659
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADZ53135

<400> 166659
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166660
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADZ53138

<400> 166660
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166661
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADZ53140

<400> 166661
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166662
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ADZ93496

<400> 166662
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166663
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEA04365

<400> 166663
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ggcuaccacg ccaacaacag caccgagacc guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggcagcaac uaccccgugg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgagaccgag 600

cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca cccccgacau cgccaccaga cccaagguga acggccuggg cagcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 166664
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEA04376

<400> 166664
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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

augguguggc ugaccgagaa gggcagcaac uaccccgugg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgagaccgag 600

cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca cccccgagau cgccaccaga cccaagguga acggccaggg cggcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

aacaagaagg uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 166665
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEA10292

<400> 166665
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugcagc 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac ccccagaggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166666
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEA10303

<400> 166666
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166667
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEA10313

<400> 166667
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaac 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166668
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEA10323

<400> 166668
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166669
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEA10339

<400> 166669
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166670
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hemagglutinin__InfluenzaA__AEA10349

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166671
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166672
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccagaagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166673
<211> 1707
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEA50985

<400> 166673

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac gacgccuacc ccaccaucaa gaucagcuac 540

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gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccuga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc cgugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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<210> 166674
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA72704

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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agaugcaaca ucugcaucug a 1701

<210> 166675
<211> 1701
<212> RNA
<213> Artificial Sequence

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 166676
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA72726

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 166677
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEA72740

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166678
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<220>
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hemagglutinin__InfluenzaA__AEA72750

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc guguucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166679
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166680
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 166681
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166682
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEA73288

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 166683
<211> 1701
<212> RNA
<213> Artificial Sequence

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 166684
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 166685
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEA73321

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc uggugacccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 166689
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166690
<211> 1701
<212> RNA
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<212> RNA
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<210> 166692
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166701
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73518

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166702
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166703
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEA73540

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166704
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEA73551

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166705
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73562

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166706
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73573

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 166707
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEA73584

<400> 166707
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag aaaccaggag 720

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 166708
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEA73595

<400> 166708
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcguggag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166724
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEA73771

<400> 166724
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166725
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166726
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEA73791

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166727
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73801

<400> 166727

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166728
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73811

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166729
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73821

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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cagugcagaa ucugcaucug a 1701

<210> 166730
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEA73831

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugacccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166731
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73841

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccgagagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcguggug 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166732
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73851

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166733
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73861

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cugagaggcg uggccccccu gcaccugggc gagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166734
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73871

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166735
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73881

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166736
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73891

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166737
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73901

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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<210> 166738
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166739
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEA73921

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166740
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73931

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166741
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166742
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEA73971

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcaacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166743
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166744
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA73991

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166745
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA74001

<400> 166745

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca gcuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166746
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA74011

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagagaaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166747
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA74021

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcaucaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166748
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEA74031

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaca accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166749
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AEA74035

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaca accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166750
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEA77299

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166751
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEB21316

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166752
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEB21326

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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cagugcagaa ucugcaucug a 1701

<210> 166753
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEB21338

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 166754
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEB21348

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__AEB40206

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 166757
<211> 1698
<212> RNA
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aacgugcccg ugaccagcag cguggaccug guggagacca accacaccgg caccuacugc 180

agccugggcg gcaucagccc cgugcaccug ggcgacugca gcuucgaggg cuggaucgug 240

ggcaaccccg ccugcgccag caaccugggc aucagagagu ggagcuaccu gaucgaggac 300

cccagcgccc cccacggccu gugcuacccc ggcgagcugg acaacaacgg cgagcugaga 360

caccuguuca gcggcaucag aagcuucagc agaaccgagc ugaucgcccc caccagcugg 420

ggcgagguga acgacggcgu gaccgccgcc ugccaggaca agggcgccag cagcuucuac 480

agaaaccugg uguggguucgu ggagagaggc aacaaguacc ccgugaucag aagaaccuac 540

aacaacacca ccggcagaga cgugcuggug aucuggggca uccaccaccc cgugagcacc 600

gacgaggcca gaaagcugua cgccaaggac aaccccuaca cccuggugag caccagcagc 660

uggagcagaa aguacaaccu ggagaccggc accagacccg gcuacaacgg ccagaagagc 720

uggaccaaga ucuacuggua ccugaugcac cccggcgaca gcaucagcuu cgagagcaac 780

ggcggccugc uggcccccaa guacggcuac aucaucgagg aguacggcaa gggcagaauc 840

uuccagagca gaaucagaau cgccaagugc aacaccaagu gccagaccag cgugggcggc 900

aucaacacca acaagaccuu ccagaacauc gagagaaacg cccugggcga cugccccaag 960

uacaucaaga gcggccagcu gaagcuggcc accggccuga gaaacgugcc cgccaucagc 1020

aacagaggcc uguucggcgc caucgccggc uucaucgagg gcggcuggcc cggccugauc 1080

aacggcuggu acggcuucca gcaccagaac gagcagggca ugggcauggc cgccgacaag 1140

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cacaucgagu acgaggagga gagcaagcug aagagacagg agaucgaggg caucaagcug 1560

aagagcgacg acaacgugua caaggcccug agcaucuaca gcugcaucgc cagcagcauc 1620

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<210> 166758
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacaagg agaagaucga cggcgugaag 1560

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<210> 166759
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEB71916

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 166760
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<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 166761
<211> 1701
<212> RNA
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<220>
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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 166762
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEB71947

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166763
<211> 1698
<212> RNA
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hemagglutinin__InfluenzaA__AEB71958

<400> 166763

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccgac 600

aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 166764
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEB71969

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<211> 1698
<212> RNA
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hemagglutinin__InfluenzaA__AEB71992

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166767
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEC13313

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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<210> 166768
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEC46553

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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<210> 166769
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEC46555

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caagaaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgagggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166770
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEC46557

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcacc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccuucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166771
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEC53259

<400> 166771
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166772
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEC53269

<400> 166772
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cugcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166773
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEC53279

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166774
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEC53289

<400> 166774
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166775
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEC53299

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166776
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEC53327

<400> 166776
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166777
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEC53347

<400> 166777
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166778
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEC53404

<400> 166778
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166779
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEC53414

<400> 166779
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166780
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEE27177

<400> 166780
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagag aaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166781
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEE27187

<400> 166781

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166782
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEE27207

<400> 166782
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caaggugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166783
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG64752

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugagaagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagacagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166784
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG64762

<400> 166784
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acacccugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaag 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacagccu gcugcccgcc agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcgccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca ccgugagcag ccuggagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca acacccugaa gggcgugacc gugagcugca gccacggcgg caagagcagc 480

uucuacagaa accugcugug gcugaccaag accggcgaca gcuaccccaa gcugaacaac 540

agcuacguga acaacaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

agcagcaacg agcagcagag ccuguaccac aacgugaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgcca gacccaaggu gagagaccag 720

cccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau ccuguucgag 780

gccaccggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcaugcac gagugcaaca ccaagugcca gacccccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgaccu gaacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac gagugcaugg agagcgugag agacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166785
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG64784

<400> 166785
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166786
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG64834

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagcg ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166787
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG64845

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166788
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG64856

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcguga ugagaagcga cgccagcauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166789
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG64867

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gugaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccacauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166790
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG64878

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gugaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccacauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166791
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG64889

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gugaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccacauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu guucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166792
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEG64911

<400> 166792
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166793
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG64922

<400> 166793
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166794
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166795
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG64944

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acaucaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166796
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG64955

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166797
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166798
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG64977

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166799
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG64988

<400> 166799

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166800
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG64999

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166801
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65010

<400> 166801
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacac cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<212> RNA
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEG65076

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacgugg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEG65087

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcacca acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaaccu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 166810
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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

aagcugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 166811
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucgc cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166812
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166813
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcgac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcccc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgugcu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166814
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65153

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcgac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcccc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166815
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEG65164

<400> 166815
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcgac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcccc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 166816
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65175

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcgagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcgaca ucugcaucug a 1701

<210> 166817
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 166817

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguac gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166818
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65197

<400> 166818
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcccca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga caucauccug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cacccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166819
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65208

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166820
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65219

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

aagugcaaca ucugcaucug a 1701

<210> 166821
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65230

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166822
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65252

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166823
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65263

<400> 166823
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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cacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166824
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65274

<400> 166824
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

cacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166825
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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cacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166826
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65296

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

cacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 166827
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65307

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166828
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugagaca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166829
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65329

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166830
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65340

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcgagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 166831
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65351

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 166832
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65362

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 166833
<211> 1701
<212> RNA
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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcgagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 166834
<211> 1701
<212> RNA
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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

cacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<211> 1701
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<400> 166835

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

cacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<220>
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cacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 166837
<211> 1701
<212> RNA
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cacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 166838
<211> 1701
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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<210> 166839
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 166840
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65461

<400> 166840
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166841
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65472

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaucac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166842
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65483

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166843
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166844
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65505

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166845
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65516

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166846
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEG65527

<400> 166846
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166847
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65538

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166848
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65560

<400> 166848
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugaagagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

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gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 166852
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<212> RNA
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hemagglutinin__InfluenzaA__AEG65604

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

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gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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<400> 166853

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gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga caugcugcug 780

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hemagglutinin__InfluenzaA__AEG65637

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga caugcugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaga 840

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<210> 166855
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcgagag aagaagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65659

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166857
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166858
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166859
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65692

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcgagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166860
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166861
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65747

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acaccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

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cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166862
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65758

<400> 166862
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166863
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG65769

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccagcaucg gcagcagacc cagaaucaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166864
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEG65780

<400> 166864
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacaagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccgcc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166865
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG65813

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ccgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166866
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG79801

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166867
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEG79807

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag caucuaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166868
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEG79835

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag caucuaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166869
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEH59363

<400> 166869
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166870
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH59367

<400> 166870
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cugggcccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166871
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH59369

<400> 166871

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166872
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH59371

<400> 166872
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166873
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH59373

<400> 166873
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagagagg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuacagacac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagagaaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166874
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH59375

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166875
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH59379

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166876
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH59381

<400> 166876
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166877
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH59383

<400> 166877
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166878
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH59385

<400> 166878
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacaucuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166879
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH59387

<400> 166879
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166880
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<212> RNA
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hemagglutinin__InfluenzaA__AEH59393

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccagccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggaccauc guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 166883
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEH59403

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggcccccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 166884
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEH59407

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 166885
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEH59409

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<210> 166886
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEH59411

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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cagugcagaa ucugcaucug a 1701

<210> 166887
<211> 1701
<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166888
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH59585

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166889
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEH59587

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccuuc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccguggug ggcaaggagu ucaacccccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166890
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEH59589

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166891
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEH59591

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccguggug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166892
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH59593

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag caucuaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166893
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEH59595

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166894
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH59597

<400> 166894
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166895
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEH59599

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166896
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEH59601

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aacugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccguggug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166897
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEH59604

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166898
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEH59614

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166899
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEH59624

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag cuucuaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166900
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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guguuccugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166901
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH77270

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166902
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEH77279

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166903
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI29215

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166904
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEI29225

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166905
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI29591

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcgacaac ccccacagaa uccuggacgg caucaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagggc 420

uucaacugga ccggcgugac ccagaacggc ggcagcagcg ccugcaagag aggccccgac 480

aacggcuucu ucagcagacu gaacuggcug uacaagagcg gcagcaccua ccccgugcag 540

aacgugacca ugcccaacaa cgacaacagc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacgugg gcagcagacc cugggugaga 720

ggccugagca gcagagugag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu acaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166906
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166907
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI54358

<400> 166907

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166908
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI54369

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 166909
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI54380

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cacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166910
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI54391

<400> 166910
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166911
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcuacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 166912
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEI54413

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 166913
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccagcaucg gcagcagacc cagaaucaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166914
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI54446

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166915
<211> 1701
<212> RNA
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<220>
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166916
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI54468

<400> 166916
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 166917
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI54479

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 166918
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 166918
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgaggug gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 166924
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<211> 1701
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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI60045

<400> 166926
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaugaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcuacagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166927
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI60086

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166928
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI60109

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cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacaa cgugcccgac 360

uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccaggacggc agcagcuacg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuacagacc cugggugaga 720

ggcgugagca gcaucaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcccc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgacauca agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacaccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca caucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcaucgugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166929
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI86734

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ugcgugggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166930
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI86764

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166931
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI86774

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166932
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI86784

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 166933
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI86794

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166934
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<212> RNA
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hemagglutinin__InfluenzaA__AEI86804

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaugug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcgccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__AEI86814

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166936
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagga cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166937
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEI86834

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcagaaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166938
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEI86854

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166939
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEI86864

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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<210> 166940
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI86874

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166941
<211> 1701
<212> RNA
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<220>
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<400> 166941
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166942
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI86904

<400> 166942
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166943
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI86914

<400> 166943

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccag acugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166944
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 166944
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc guguucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcugaucaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166945
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI86934

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166946
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI86944

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166947
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI86964

<400> 166947
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc guguucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166948
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI86974

<400> 166948
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166949
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI86984

<400> 166949
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166950
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI86994

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166951
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI87004

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcaggg ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166952
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI87014

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cggcgaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166953
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI87034

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccauc ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166954
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 166955
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI87054

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166956
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI87064

<400> 166956
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166957
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI87074

<400> 166957
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166958
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI87094

<400> 166958
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa caccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcauc 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166959
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEI87104

<400> 166959
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa caccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcauc 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166960
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI91963

<400> 166960
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 166961
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI91977

<400> 166961

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166962
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI91978

<400> 166962
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgcccaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166963
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI91998

<400> 166963
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166964
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEI91999

<400> 166964
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccugaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 166965
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEI92018

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 166966
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEJ10400

<400> 166966
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166967
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEJ10410

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

agcgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166968
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEJ10420

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gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166969
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEJ10430

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166970
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEJ10440

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagau ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166971
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEJ10450

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166972
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEJ10480

<400> 166972
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag agcgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166973
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEJ10490

<400> 166973
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcagaugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166974
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEJ10500

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gugaccguga cccacagcgu gaaccugcug gagggcaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166975
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEJ10510

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166976
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEJ10520

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaacuacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166977
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 166977
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166978
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEJ10540

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166979
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEJ10550

<400> 166979

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166980
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEJ10570

<400> 166980
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166981
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEJ10580

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166982
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEJ36302

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcuaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag acuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166983
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEJ36312

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acauccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166984
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEJ37853

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggaggccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166985
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEJ37863

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaagcu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 166986
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEJ37873

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166987
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEJ37883

<400> 166987
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 166988
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEJ37893

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacaa gcccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 166989
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEJ37903

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugge ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166990
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca ucgagagaau ggccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166991
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEJ37943

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166992
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEJ37953

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 166993
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEJ37963

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccacca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 166994
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEJ37973

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 166995
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEJ37983

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166996
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hemagglutinin__InfluenzaA__AEK21369

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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<400> 166997

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgaga uggagagaaa gagcggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 166999
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcaugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 167000
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc guguucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cagugcagaa ucugcaucug a 1701

<210> 167001
<211> 1701

<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEK21436

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167003
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agaacgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167004
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK21466

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugge ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167005
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK21476

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167006
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEK21486

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167007
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK28774

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucc accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167008
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEK28785

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ggcaacgaca acagcgccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccaggug gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucc accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167009
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEK28796

<400> 167009
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 167010
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEK28807

<400> 167010
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucc accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 167011
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEK28818

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacaaca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacu gagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

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cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca caucaagggc 1560

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<212> RNA
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gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<212> RNA
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<220>
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167019
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK28905

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga gauucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167020
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcguga ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167021
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK28927

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucc accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167022
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugccuga agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167023
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK28960

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167024
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK28971

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167025
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEK28982

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ggcaacuaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucc accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167026
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEK28993

<400> 167026
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ggcaacuaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167027
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hemagglutinin__InfluenzaA__AEK29004

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 167028
<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagga caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua cagcgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaugca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 167029
<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167030
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEK29070

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucc accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167031
<211> 1701
<212> RNA
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<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucc accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167032
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK29092

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 167033
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK29125

<400> 167033

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 167034
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK29136

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167035
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEK29169

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167036
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK29180

<400> 167036
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167037
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEK29191

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167038
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK29202

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167039
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEK29213

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167040
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEK29224

<400> 167040
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167041
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEK29235

<400> 167041
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167042
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEK29268

<400> 167042
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167043
<211> 1698
<212> RNA
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hemagglutinin__InfluenzaA__AEK59838

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

gaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca agaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggca acaccaucau cuucgaggcc 780

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 167044
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<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167045
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 167046
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEK98382

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167047
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK98386

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagaac cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167048
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK98388

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 167049
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEK98390

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 167050
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEK98392

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucagacug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuacagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167059
<211> 1692
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL31632

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcggcgugag cagcgugugc cccuaccagg gcagaagcag cuucuucaga 480

aacguggugu ggcugaccaa gaaggacaac gccuacccca ccaucaagag aagcuacaac 540

aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgccgcc 600

gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgagc uggaguacgg caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gggcgagacc 1020

agaggccugu ucggcgccau cgccggcuuc aucgagggcg gcuggcaggg caugguggac 1080

ggcugguacg gcuaccacca cagcaacgag cagggcagcg gcuacgccgc cgacaaggag 1140

agcacccaga aggccaucga cggcgugacc aacaagguga acagcaucau cgacaagaug 1200

aacacccagu ucgaggccgu gggcagagag uucaacaacc uggagagaag aaucgagaac 1260

cugaacaaga agauggagga cggcuuccug gacgugugga ccuacaacgc cgagcugcug 1320

gugcugaugg agaacgagag aacccuggac uuccacgaca gcaacgugaa gaaccuguac 1380

gacaagguga gacugcagcu gagagacaac gccaaggagc ugggcaacgg cugcuucgag 1440

uucuaccaca gaugcgacaa cgagugcaug gagagcguga gaaacggcac cuacgacuac 1500

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gccaucaugg uggccggccu guuccugugg augugcagca acggcagccu gcagugcaga 1680

aucugcaucu ga 1692

<210> 167060
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL89297

<400> 167060
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167061
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89307

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167062
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEL89317

<400> 167062
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167063
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89327

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167064
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89337

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167065
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89347

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167066
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89357

<400> 167066
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167067
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEL89367

<400> 167067
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167068
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89391

<400> 167068
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167069
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89401

<400> 167069

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167070
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89411

<400> 167070
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167071
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89421

<400> 167071
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167072
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89441

<400> 167072
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167073
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89451

<400> 167073
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167074
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL89461

<400> 167074
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167075
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89471

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167076
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL89481

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167077
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL89491

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167078
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89501

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacgaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167079
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89511

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167080
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEL89521

<400> 167080
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167081
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89531

<400> 167081
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugccag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167082
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89541

<400> 167082
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167083
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL89551

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167084
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL89561

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccgagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167085
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEL89571

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167086
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89581

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167087
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89591

<400> 167087

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167088
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89601

<400> 167088
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167089
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL89611

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167090
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL89621

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167091
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89631

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167092
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89641

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167093
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89651

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc guguucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguucg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167094
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL89661

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167095
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89671

<400> 167095
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag agcgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167096
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89691

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167097
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL89701

<400> 167097
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagaa ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167098
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 167098
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagaa ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167099
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89721

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167100
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL89741

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167101
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89751

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167102
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89761

<400> 167102
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167103
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89771

<400> 167103
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167104
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL89781

<400> 167104
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167105
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEL89791

<400> 167105

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167106
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL89801

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc guguucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167107
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEL89812

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgugauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167108
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEL89832

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167109
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL89842

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167110
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEL89852

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 167111
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL93568

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167112
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL93578

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167113
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL93598

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc guguucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167114
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL93618

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167115
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167116
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEL93638

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167117
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL94870

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167118
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL95426

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167119
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEL97631

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167120
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEL99664

<400> 167120
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccauccu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167121
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEL99674

<400> 167121
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caucuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167122
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEM53455

<400> 167122
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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcauccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggcagcaac uaccccgugg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgagaccgag 600

cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca cccccgacau cgccaccaga cccaagguga acggccuggg cggcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccugggcaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 167123
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEM53468

<400> 167123

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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agauacagcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaga auccugccca aggacggcug gacccagcac 420

accaccagcg gcggcagcaa ggccugcgcc gugagcggca agagcagcuu cuucagaaac 480

augguguggc ugaccaagaa gggccccaac uaccccgugg ccaagagaag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaagga cgaggccgag 600

cagagagccc uguaccagaa gguggggcacc uacgugagcg ccagcaccag cacccugaac 660

aagagaagca cccccgagau cgccgccaga cccgagguga acggccuggg cagcagaaug 720

gaguucagcu ggacccugcu ggacgugugg gacaccauca acuucgagag caccggcaac 780

cugguggccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccugggcaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacag aaucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agaagagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacaac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugagc agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaagaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaucg ccggcaucag ccuguggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 167124
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEM60037

<400> 167124
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgugaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 167125
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEM60058

<400> 167125
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggagagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggacgugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 167126
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEM60069

<400> 167126
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167127
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEM92308

<400> 167127
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagagaaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccgaga accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__AEM92318

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgagaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167130
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgagaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167131
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaagau gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167132
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167133
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<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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cagugcagaa ucugcaucug a 1701

<210> 167134
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aacagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca ucgagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167135
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEM92417

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__AEM92428

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaagaucag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167140
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEM92468

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaaggaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaucugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167141
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEM92478

<400> 167141

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaucugcca gacccccaag 900

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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cagugcagaa ucugcaucug a 1701

<210> 167142
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aacagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167143
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEM92518

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEM92528

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aucagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

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<212> RNA
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEM92638

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acaccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167158
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEN55418

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167159
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN55463

<400> 167159

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167160
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN55473

<400> 167160
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag accgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaccaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167161
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN55483

<400> 167161
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167162
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN55493

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167163
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN55503

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167164
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN55513

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagaa ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167165
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEN55523

<400> 167165
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167166
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEN68904

<400> 167166
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167167
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN68905

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167168
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEN68906

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167169
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEN68907

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167170
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEN68908

<400> 167170
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167171
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEN68909

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ugcgugggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167172
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEN68910

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ugcgugggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagggcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167173
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEN68911

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167174
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEN68912

<400> 167174
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167175
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167176
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN68914

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167177
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN68915

<400> 167177

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167178
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN68916

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167179
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN68917

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167180
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN68918

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gugaccguga cccacagcgu gaaccugcug gaggacaaga acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167181
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN68919

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167182
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEN68920

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN68921

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167184
<211> 1701
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hemagglutinin__InfluenzaA__AEN68922

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167185
<211> 1701
<212> RNA
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<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167186
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN68924

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167187
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN68925

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cguggagacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167188
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEN68926

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu ggccaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg cagagaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167189
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEN68927

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__AEN68928

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 167191
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN68929

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167192
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN68930

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167193
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 167193
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167194
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN68932

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167195
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEN69426

<400> 167195

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167196
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEN69475

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167197
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEN69481

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaacg ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167198
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01032

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccuggac aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167199
<211> 1701

<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01033

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167200
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hemagglutinin__InfluenzaA__AEO01034

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167201
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01035

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167202
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01036

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167203
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01037

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167204
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01038

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167205
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01039

<400> 167205
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167206
<211> 1701
<212> RNA
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<220>
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<400> 167206
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caagaaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167207
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01041

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167208
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01042

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167209
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01043

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcaaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167210
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01044

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167211
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01045

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccuggagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167212
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01046

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167213
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01047

<400> 167213

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167214
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01048

<400> 167214
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcaaga ucugcaucug a 1701

<210> 167215
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01049

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167216
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01050

<400> 167216
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167217
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01051

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167218
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01052

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167219
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01053

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167220
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01054

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167221
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01055

<400> 167221
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167222
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01056

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167223
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01057

<400> 167223
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167224
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO01058

<400> 167224
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167225
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01059

<400> 167225
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167226
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01060

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167227
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01061

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167228
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01062

<400> 167228
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167229
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<400> 167231

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEO01066

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 167233
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01067

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag auggccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcaucug a 1701

<210> 167234
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01068

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

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<210> 167235
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<212> RNA
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hemagglutinin__InfluenzaA__AEO01069

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167236
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01070

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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hemagglutinin__InfluenzaA__AEO01079

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167247
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167248
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
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<400> 167249

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167250
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01085

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167251
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01086

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167260
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 167261
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hemagglutinin__InfluenzaA__AEO01096

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167262
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01097

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167263
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01098

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167264
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01099

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167265
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167266
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01101

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167267
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01102

<400> 167267

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167275
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01110

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167276
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01111

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167277
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01112

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167278
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ugcacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167279
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01114

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167280
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01115

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc ugcacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 167281
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01116

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167282
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01117

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEO01119

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__AEO01120

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__AEO01121

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__AEO01122

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<212> RNA
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hemagglutinin__InfluenzaA__AEO01124

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<210> 167290
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01125

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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hemagglutinin__InfluenzaA__AEO01129

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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hemagglutinin__InfluenzaA__AEO01130

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hemagglutinin__InfluenzaA__AEO01132

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hemagglutinin__InfluenzaA__AEO01133

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167299
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01134

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167300
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01135

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167301
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01136

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167302
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 167303
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01138

<400> 167303

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167304
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01139

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167305
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01140

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEO01141

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__AEO01142

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEO01144

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aucagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__AEO01145

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167310
<211> 1701
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hemagglutinin__InfluenzaA__AEO01146

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 167312
<211> 1701
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hemagglutinin__InfluenzaA__AEO01148

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<210> 167313
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<212> RNA
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hemagglutinin__InfluenzaA__AEO01149

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167314
<211> 1701
<212> RNA
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<220>
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<400> 167314
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167315
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01151

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167316
<211> 1701
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hemagglutinin__InfluenzaA__AEO01152

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167317
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01153

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167318
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01154

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167319
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01155

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 167320
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01156

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167321
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01157

<400> 167321

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167322
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01158

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEO01159

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEO01160

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 167325
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01161

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167326
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01162

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167327
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01163

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 167328
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01164

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167329
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01165

<400> 167329
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa guucagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167330
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01166

<400> 167330
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167331
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01167

<400> 167331
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167332
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO01168

<400> 167332
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167333
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01169

<400> 167333
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167334
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01170

<400> 167334
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167335
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01171

<400> 167335
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167336
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01172

<400> 167336
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167337
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 167337
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcggcaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167338
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01174

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167339
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01176

<400> 167339

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167340
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01177

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167341
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01179

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167342
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01180

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167343
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01181

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167344
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01182

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__AEO01183

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEO01184

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEO01185

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__AEO01186

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167349
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hemagglutinin__InfluenzaA__AEO01187

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167350
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167351
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01189

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167352
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01191

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167360
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01200

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167361
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01201

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gugaccguga cccacagcgu gaaccugcug gaggagaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167362
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01202

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167363
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01203

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167364
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01204

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167365
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01205

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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cagugcagaa ucugcaucug a 1701

<210> 167366
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01206

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167367
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01207

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__AEO01209

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 167371
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 167372
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01212

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167373
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167374
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01214

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167375
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01215

<400> 167375

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<212> RNA
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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hemagglutinin__InfluenzaA__AEO01223

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01224

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ccgagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167385
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01225

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggaccgug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167386
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgacggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167387
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01228

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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<210> 167389
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01229

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167390
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01230

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag caaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167399
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01240

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167400
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01241

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167401
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hemagglutinin__InfluenzaA__AEO01242

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167402
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01244

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167403
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01245

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167404
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

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cagugcagaa ucugcaucug a 1701

<210> 167405
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01248

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167406
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01249

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167407
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01250

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgaggacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167408
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01251

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167409
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01252

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167410
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01253

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167411
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01254

<400> 167411

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 167412
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01256

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 167413
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01257

<400> 167413
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167414
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hemagglutinin__InfluenzaA__AEO01258

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167415
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AEO01259

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167416
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hemagglutinin__InfluenzaA__AEO01260

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167417
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hemagglutinin__InfluenzaA__AEO01261

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccggcau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167418
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01262

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167419
<211> 1701
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hemagglutinin__InfluenzaA__AEO01263

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 167420
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01264

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

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<210> 167421
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01265

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167422
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<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEO01267

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01268

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 167425
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01269

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167426
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01270

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167427
<211> 1701
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hemagglutinin__InfluenzaA__AEO01271

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<210> 167428
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hemagglutinin__InfluenzaA__AEO01272

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 167429
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01273

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167430
<211> 1701
<212> RNA
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<220>
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<400> 167430
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167431
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01275

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167432
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01276

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167433
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01277

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167434
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01278

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167435
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01279

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaac cgccggcagc 840

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<210> 167436
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01282

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167437
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01283

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEO01284

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<212> RNA
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167441
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hemagglutinin__InfluenzaA__AEO01287

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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hemagglutinin__InfluenzaA__AEO01288

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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hemagglutinin__InfluenzaA__AEO01289

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hemagglutinin__InfluenzaA__AEO01290

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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hemagglutinin__InfluenzaA__AEO01294

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__AEO01296

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEO01300

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__AEO01304

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 167459
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01306

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 167460
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01307

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167461
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag caaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacagagg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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hemagglutinin__InfluenzaA__AEO01311

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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hemagglutinin__InfluenzaA__AEO01313

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<210> 167467
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hemagglutinin__InfluenzaA__AEO01314

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167468
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01315

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacagaaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167469
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01316

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167470
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167471
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01318

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167472
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167473
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01321

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167474
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01322

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 167475
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01323

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag gacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167480
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hemagglutinin__InfluenzaA__AEO01328

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cagugcagaa ucugcaucug a 1701

<210> 167481
<211> 1701
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<210> 167482
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<211> 1701
<212> RNA
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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaccaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167484
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01333

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167485
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01334

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167486
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01335

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167487
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AEO01336

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167488
<211> 1701
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hemagglutinin__InfluenzaA__AEO01337

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167489
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01338

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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hemagglutinin__InfluenzaA__AEO01339

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cagugcagaa ucugcaucug a 1701

<210> 167491
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167500
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01349

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaga acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag caaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01350

<400> 167501

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167502
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01351

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167503
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01352

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 167504
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01353

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 167505
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AEO01354

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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cagugcagaa ucugcaucug a 1701

<210> 167506
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01355

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167507
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01356

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167508
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01358

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167509
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167510
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01360

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167511
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01361

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167512
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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<210> 167513
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01363

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167514
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01365

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaag cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167515
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01366

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167516
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01367

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167517
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaacac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167518
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hemagglutinin__InfluenzaA__AEO01369

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167519
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01370

<400> 167519

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167520
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01371

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 167521
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01372

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167522
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01373

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167523
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01374

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167524
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01375

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcgagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167525
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01376

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167526
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01377

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167527
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01378

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcaucug a 1701

<210> 167528
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01379

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<210> 167529
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01380

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167530
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 167530
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167531
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01382

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167532
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01383

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167533
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01384

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugagcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167534
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01385

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccaacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167535
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO01386

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167536
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01387

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167537
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01388

<400> 167537

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaccaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167538
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01389

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg caccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167539
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01390

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cguggagacc 660

agcagauaca gcaagaaggu gaagcccgag aucgccauca gacccagagu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgagguggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167540
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01391

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167541
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AEO01392

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167542
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01393

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167543
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01394

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167544
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01395

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuuccugg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167545
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01396

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167546
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01397

<400> 167546
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacaccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167547
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO01398

<400> 167547
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccaacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167548
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO01399

<400> 167548
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167549
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01402

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167550
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01403

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167551
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01404

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167552
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01405

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167553
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 167553
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagca cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167554
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01408

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167555
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01409

<400> 167555

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167556
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01410

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167557
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01411

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167558
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01412

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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<210> 167559
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01413

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167560
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01414

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa caccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcagca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167561
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01416

<400> 167561
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167562
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01418

<400> 167562
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167563
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01419

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167564
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01420

<400> 167564
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaguacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167565
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01421

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167566
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO01422

<400> 167566
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaacc uguaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167567
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01423

<400> 167567
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucaccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167568
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01424

<400> 167568
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167569
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01425

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167570
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01426

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167571
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167572
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01428

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167573
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01429

<400> 167573

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167574
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01430

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgacgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167575
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01431

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167576
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01432

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167577
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01434

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cugagaggcg uggccccccu gcaccugggc gagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167578
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccguguac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167579
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01436

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167580
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01437

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167581
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01438

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167582
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01440

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167583
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01441

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgacggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167584
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO01442

<400> 167584
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167585
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01443

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167586
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01444

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167587
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01445

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167588
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01446

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167589
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO01447

<400> 167589
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccau cgccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167590
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01448

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167591
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01449

<400> 167591

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167592
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO01450

<400> 167592
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167593
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01451

<400> 167593
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167594
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01452

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccga ggccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167595
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01453

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagagagag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167596
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01454

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaccaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167597
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01455

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167598
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01456

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggacagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167599
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01457

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167600
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01458

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167601
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01459

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167602
<211> 1701
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167603
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01462

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167604
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01463

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 167605
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01464

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggacagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 167606
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01465

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167607
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01466

<400> 167607
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<210> 167613
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<212> RNA
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<210> 167614
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hemagglutinin__InfluenzaA__AEO01473

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 167615
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hemagglutinin__InfluenzaA__AEO01474

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEO01476

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167618
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hemagglutinin__InfluenzaA__AEO01477

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167619
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hemagglutinin__InfluenzaA__AEO01478

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<210> 167621
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hemagglutinin__InfluenzaA__AEO01480

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aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<210> 167622
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01482

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcaacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167623
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01483

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 167624
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01484

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167625
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucaccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167626
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01487

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

acccuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167627
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01488

<400> 167627

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167628
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01489

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu cagacccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167629
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01490

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167630
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01491

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gugaccguga cccacagcgu gaaccugcug gaggacaagu acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167631
<211> 1701

<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01492

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167632
<211> 1701
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hemagglutinin__InfluenzaA__AEO01493

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaag cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167633
<211> 1701
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hemagglutinin__InfluenzaA__AEO01494

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167634
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01496

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 167635
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01497

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167636
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01498

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<210> 167637
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01499

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167638
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01501

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEO01502

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167641
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167642
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01505

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167643
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 167644
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

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<210> 167645
<211> 1701
<212> RNA
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<220>
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<400> 167645

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cugagaggcg ugacccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167654
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gaucgugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcgagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu cagacccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167657
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167659
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 167660
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hemagglutinin__InfluenzaA__AEO01524

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167661
<211> 1701
<212> RNA
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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 167667
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<212> RNA
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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167669
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01534

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agaagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167670
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01535

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167671
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01536

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167672
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01537

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167673
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01538

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugggcggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167674
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO01539

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 167675
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01540

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacgagaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167676
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01541

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagca cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167677
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167678
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167679
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167680
<211> 1701
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hemagglutinin__InfluenzaA__AEO01545

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acagcggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucgugg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167681
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01546

<400> 167681

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167682
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01547

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 167683
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01548

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 167684
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01549

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167700
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01566

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167701
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01567

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167702
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01568

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167703
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01569

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167704
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01570

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167705
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167706
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01572

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167707
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01573

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167708
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01574

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01575

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167710
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167711
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01577

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167712
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01578

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167713
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01579

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167714
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01581

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167715
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 167715
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167716
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01583

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167717
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01584

<400> 167717

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167718
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01585

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167719
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01586

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167720
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEO01587

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167721
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01588

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167722
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01589

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167723
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hemagglutinin__InfluenzaA__AEO01590

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01591

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167725
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01592

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167726
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01593

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167727
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01594

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 167728
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167729
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01596

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167730
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEO01597

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167731
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<220>
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hemagglutinin__InfluenzaA__AEO01598

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa cggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167734
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__AEO01601

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167735
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01602

<400> 167735

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167736
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01603

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167737
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01604

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167738
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01605

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167739
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01606

<400> 167739
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167740
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO01607

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167741
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01608

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167742
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01609

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167743
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01610

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagag ugugcaucug a 1701

<210> 167744
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01611

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg cagagaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcgagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167745
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO01612

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgccacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167746
<211> 1701
<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

uacuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167749
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167750
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

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<210> 167752
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__AEO01620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 167753
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 167753

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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agcagcagca ccggcgagau cugcgacagc ccccaccagg ugcuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgaggugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccagg ugcuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagagugac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<211> 1698

<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugcccaucgg cgagugcccc 960

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaga 1560

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<210> 167758
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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<210> 167759
<211> 1701
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgaggugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 167760
<211> 1698
<212> RNA
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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 167761
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO01709

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaagcugag agaccaggac 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaccau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgagcugu accugaagug caacggcgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 167762
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO37530

<400> 167762
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167763
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO72176

<400> 167763
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg ccgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167764
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO88980

<400> 167764
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccacag caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167765
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO89021

<400> 167765
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cccaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggggca uccaccacag caacaacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccuga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

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gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167766
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89030

<400> 167766
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgug ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccacag caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cgugcugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167767
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89048

<400> 167767
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacguga ucuggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggggca uccaccacag caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

cugaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

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cugcagugca gaaucugcau cuga 1704

<210> 167768
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89065

<400> 167768
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgug ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggggca uccaccacag caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccuga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccagcgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

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cugcagugca gaaucugcau cuga 1704

<210> 167769
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO89082

<400> 167769
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgacacca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca acaaggagga ccugcugauc cugugggca uccaccacag caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

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cugcagugca gaaucugcau cuga 1704

<210> 167770
<211> 1704
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEO89091

<400> 167770
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagaa cauccuggag aagacccaca acggcaagcu gugcgacauc 180

gacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcacc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccacag caacgacgag 600

gccgagcagg ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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cugcagugca gaaucugcau cuga 1704

<210> 167771
<211> 1704
<212> RNA
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<220>
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<400> 167771

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggggca uccaccacag caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuuccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

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agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167772
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO89109

<400> 167772
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagaa ccugcugauc cugugggca uccaccacag caacgacgcc 600

gccgagcaga ucaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugac caagaucgcc accagaccca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga aggagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167773
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO89127

<400> 167773
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagaa ccugcugauc cugugggca uccaccacag caacgacgcc 600

gccgagcaga ucaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga aggagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa gaagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

aucaagcugg agagcauggg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167774
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO89145

<400> 167774
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugggcgac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acaaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugac caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggggca uccaccacag caacaacgcc 600

gccgagcagg agaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

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aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

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accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cgccgccagc 1620

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cugcagugca gaaucugcau cuga 1704

<210> 167775
<211> 1707

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89163

<400> 167775
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cgacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

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cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaacag cagcuucuuc 480

agaaacgugg uguggcugau caagaagggc aacgccuacc ccaccaucaa gaagagcuac 540

aacaacacca acaaggagga ccugcugauc cugugggca uccaccaccc caacgacgag 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaaucgacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

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aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

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agccugcagu gcagaaucug caucuga 1707

<210> 167776
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89172

<400> 167776
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accgugaccc acgcccagaa cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccacag caacgacgcc 600

accgagcaga ucaagcugua ccagaacccc accaccuacg ugagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc agcaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

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<210> 167777
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89181

<400> 167777
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcgac 420

cacgaggcca gccugggcgu gagcgccgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gaagggcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgag 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca agaucaacgg ccagagcggc 720

agaaucgacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agguggagua cggcaacugc aacaccagau gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

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agaaaccugu acgacaaggu gagacugcag cugaaggaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caucuaccag auccugagca ucuacagcac cguggccagc 1620

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cugcagugca gaaucugcau cuga 1704

<210> 167778
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89192

<400> 167778
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagaa ccugcugauc cugugggca uccaccacag caacgacgcc 600

gccgagcaga ucaagcugua ccagaacccc accaccuacg ugagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga aggagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuacccc cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucaacggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167779
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEO89203

<400> 167779
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagaa ccugcugauc cugugggggca uccaccacag caacgacgcc 600

gccgagcaga ucaagcugua ccagaacccc accaccuacg ugagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga aggagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucaacggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

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cugcagugca gaaucugcau cuga 1704

<210> 167780
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89213

<400> 167780
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagaa ccugcugauc cugugggggca uccaccacag caacgacgcc 600

gccgagcaga ucaagcugua ccagaacccc accaccuacg ugagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga aggagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucaacggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167781
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89224

<400> 167781
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagaa ccugcugauc cugugggca uccaccacag caacgacgcc 600

gccgagcaga ucaagcugua ccagaacccc accaccuacg ugagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga aggagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucaacggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167782
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO89235

<400> 167782
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacguga ucuggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccacag caacgacgag 600

gccgagcaga ucaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccgacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

aagagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

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cugcagugca gaaucugcau cuga 1704

<210> 167783
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO89246

<400> 167783
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggggca uccaccacag caacgacgag 600

gccgagcaga ucaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccgacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167784
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89257

<400> 167784
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccacag caacgacgcc 600

gccgagcaga ucaagcugua ccagaacccc accaccuacg ugagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc agcaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggugc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167785
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89268

<400> 167785
auggagaaga ucgugcugcu gcuggccauc gugagccugg ugagaagcga ccagaucugc 60

aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccacag caacgacgcc 600

gccgagcaga ucaagcugua ccagaacccc accaccuacg ugagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc agcaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggugc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167786
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89279

<400> 167786
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugggcgac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acaaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggggca uccaccacag caacaacgcc 600

gccgagcagg agaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg gcgugaagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cgccgccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167787
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO89289

<400> 167787
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugggcgac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acaaguucau caacgugccc gaguggagcu acaucgugga gaaggugaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc aagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccacag caacaacgug 600

gccgagcagg agaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgaca ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg gcguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu accccagaua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cgccgccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167788
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89300

<400> 167788
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagaa ccugcugauc cugugggca uccaccacag caacgacgcc 600

gccgagcaga ucaagcugua ccagcacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga aggagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucaacggc 1560

gugaagcugg agagcauggg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagcuucu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 167789
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEO89311

<400> 167789

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaaggacag cuggagcgac 420

cacgaggcca gccugggcgu gagcgccgcc ugccccuacc agggcaacag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gaagagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccaccc caacgacgag 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaaucgacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agguggagua cggcaacugc aacaccagau gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaccaagcu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa gcuggagaga 1260

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcaac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caucuaccag auccugagca ucuacagcac cguggccagc 1620

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cugcagugca gaaucugcau cuga 1704

<210> 167790
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO99215

<400> 167790
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167791
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEQ38187

<400> 167791
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgccagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 167792
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEQ38188

<400> 167792
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgccagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

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hemagglutinin__InfluenzaA__AEQ38189

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagccc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgugc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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<212> RNA
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hemagglutinin__InfluenzaA__AEQ38194

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgccagcgcc agcugcagcc acaacggcga gaacagcuuc 480

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aucgccaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgccagcgcc agcugcagcc acaacggcga gaacagcuuc 480

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aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gaguacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgccagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgccagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccgcc 300

agccccgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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uucuacaaga accugaugug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cagugcagaa ucugcaucug a 1701

<210> 167806
<211> 1701
<212> RNA
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<220>
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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

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<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<210> 167808
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 167809
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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 167810
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccagcga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 167811
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<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 167812
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167813
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 167814
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AER08664

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cagcgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 167815
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AER08668

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 167816
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AER08670

<400> 167816
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 167817
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cggcaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cagcgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 167818
<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167819
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167820
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167821
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AER08680

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 167822
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AER08682

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 167823
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 167828
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AER08698

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 167829
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AER08700

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AER92712

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca ucgagagaaa cgccggcagc 840

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<210> 167831
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AET10090

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167832
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AET10091

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167833
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AET10092

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167834
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AET10094

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcagcugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167835
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AET10095

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cacccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167836
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AET10096

<400> 167836
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga ucaucgacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

aaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167837
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AET10098

<400> 167837
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga ucaucgacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167838
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AET10099

<400> 167838
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 167839
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AET10100

<400> 167839
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167840
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcgccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167841
<211> 1701
<212> RNA
<213> Artificial Sequence

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuucga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaag 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacga cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcagaa ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggccag ccugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167842
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167843
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AET10104

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aacagcagca ccggcgagau cugcgacagc ccccaccaga ucaucgacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accugggcaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167844
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AET10105

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 167845
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AET10106

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 167846
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AET10107

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aagugcaaca ucugcaucug a 1701

<210> 167847
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AET10108

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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aagugcaaca ucugcaucug a 1701

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

agcaacagca ccggcaaccu gaucggcccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167851
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugca gaacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 167852
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AET10114

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca ucagcaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

augugcaaca ucugcaucug a 1701

<210> 167853
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AET50439

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<211> 1698
<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccacccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 167855
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AET50441

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaucug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccacccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgaggug gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucaacgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 167860
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aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucaacgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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<211> 1698
<212> RNA
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hemagglutinin__InfluenzaA__AET84218

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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<210> 167862
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<212> RNA
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hemagglutinin__InfluenzaA__AET84229

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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hemagglutinin__InfluenzaA__AET84240

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgugaacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacaagg agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 167868
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hemagglutinin__InfluenzaA__AET84339

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 167869
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AET84361

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucggcaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 167870
<211> 1698
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AET84372

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccgac 600

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccgac 600

aucggcaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccgac 600

aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167886
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hemagglutinin__InfluenzaA__AEW10644

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167889
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccga ggccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167890
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167891
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167892
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167893
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEW10724

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<400> 167897

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccaacg ccuacguguu cgugggcagc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 167898
<211> 1701
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 167899
<211> 1701
<212> RNA
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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 167901
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<212> RNA
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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167902
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEW10814

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167903
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167904
<211> 1701
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hemagglutinin__InfluenzaA__AEW10834

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167905
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW10844

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167906
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEW10854

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucaccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167907
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEW10864

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 167908
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 167909
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW10884

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AEW10914

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167913
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 167914
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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<210> 167915
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEW10944

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<210> 167916
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167917
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEW10964

<400> 167917
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167918
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW10974

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167919
<211> 1701

<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AEW10984

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167920
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW10994

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167921
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW11004

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167922
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11014

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 167923
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11024

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167924
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW11034

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167925
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW11044

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167926
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167927
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW11064

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167928
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW11074

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167929
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11084

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ugcacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167930
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11094

<400> 167930
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167931
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11104

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167932
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11114

<400> 167932
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167933
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW11124

<400> 167933

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguucg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167934
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW11134

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca aggaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167935
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW11144

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167936
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11154

<400> 167936
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167937
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11164

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ugcacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167938
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11174

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ugcacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167939
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11184

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167940
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW11194

<400> 167940
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167941
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11204

<400> 167941
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167942
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11214

<400> 167942
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167943
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11224

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167944
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEW11234

<400> 167944
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167945
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11244

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167946
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11254

<400> 167946
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ugcacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

gccagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaggu gaagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167947
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW11263

<400> 167947
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167950
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167951
<211> 1701
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<400> 167951

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagag ugugcaucug a 1701

<210> 167952
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

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<212> RNA
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<220>
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167954
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<212> RNA
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hemagglutinin__InfluenzaA__AEW22712

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 167955
<211> 1701

<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug gugaagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167956
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW22720

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167957
<211> 1701
<212> RNA
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<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167958
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW22724

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167959
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW25297

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gaucccccggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaga 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167960
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW25306

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167961
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 167961
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167962
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEW25331

<400> 167962
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167963
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25349

<400> 167963
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167964
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW25367

<400> 167964
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag acuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167965
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW25377

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac gccugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167966
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW25385

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugcccag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167967
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEW25416

<400> 167967
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167968
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25446

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 167969
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25454

<400> 167969

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167970
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25462

<400> 167970
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

cccuacacca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167971
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25472

<400> 167971
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167972
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25482

<400> 167972
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaag 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

ggcggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagc uguaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167973
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEW25492

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacaucuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167974
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25501

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug ccuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167975
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25509

<400> 167975
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167976
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25519

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacaccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167977
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25528

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagagaagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167978
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25545

<400> 167978
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcagc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugaugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167979
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25555

<400> 167979
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac uacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167980
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEW25564

<400> 167980
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgcccuga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacagaaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccggcau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167981
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25573

<400> 167981
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167982
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25582

<400> 167982
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucaucc ugagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacggcc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167983
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25590

<400> 167983
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccagagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gaggccagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccugcacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167984
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25600

<400> 167984
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167985
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25620

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167986
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25629

<400> 167986
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25696

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagcuu cagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167995
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW25706

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167996
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEW91908

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcgac 420

cacgaggcca gccugggcgu gagcgccgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gaagggcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgag 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca agaucaacgg ccagagcggc 720

agaaucgacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agguggagua cggcaacugc aacaccagau gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

accagaggcc uguucggcgc caucgccggc uucaucgagg gcggcuggca gggcauggug 1080

gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

gagagcaccc agaaggccau cgacggcgug accaacaagg ugaacagcau caucgacaag 1200

augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

aaccugaaca agaagaugga ggacggcuuc cuggacgugu ggaccuacaa cgccgagcug 1320

cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gagaaaccug 1380

uacgacaagg ugagacugca gcugaaggac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggug 1620

cuggccauca ugauggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 167997
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX09175

<400> 167997
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

guggccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167998
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEX25795

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 167999
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEX25797

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168000
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX25798

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168001
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX25800

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168002
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<220>
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hemagglutinin__InfluenzaA__AEX25803

<400> 168002
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168003
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX25808

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168004
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEX25810

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccagagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168005
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX25811

<400> 168005

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa ggccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168006
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX25814

<400> 168006
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccagagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168007
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX25816

<400> 168007
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aacagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 168008
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX25818

<400> 168008
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccagagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168009
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX25824

<400> 168009
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg uggagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag agcggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

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cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcgac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168014
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168015
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEX33497

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 168016
<211> 1701
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<220>
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<211> 1701
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<220>
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hemagglutinin__InfluenzaA__AEX33519

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168018
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aucagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgacugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168020
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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168021
<211> 1701
<212> RNA
<213> Artificial Sequence

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168022
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEX33618

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168023
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX33629

<400> 168023

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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<210> 168024
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX33640

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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<210> 168025
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX33836

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga caucuuccug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<211> 1698

<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gaacagcugg 420

cccaaccaca ccaccaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaagaagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

agccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgccaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccagaag 720

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 168029
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<212> RNA
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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168030
<211> 1701
<212> RNA
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cccggcaccg acaacgacca gaucuuccug cacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168031
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaacggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168032
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AEX33990

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

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cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagagc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168033
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEX34001

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cagcgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaacg ccgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168034
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168035
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX34023

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168036
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34044

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168037
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX34089

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcagc 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168038
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX34123

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168039
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34134

<400> 168039
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ggcaacgaca acagcauggc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168040
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34145

<400> 168040
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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168041
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168041

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcggcagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168042
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168042
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168043
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168043
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaacugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168044
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34199

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168045
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34221

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugcg acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168046
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34243

<400> 168046
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168047
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34254

<400> 168047
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168048
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34265

<400> 168048
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168049
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX34275

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcugcac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168050
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX34318

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168051
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX34329

<400> 168051
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu ggugagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga gggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 168052
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEX34352

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccugaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168053
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX34364

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168054
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34375

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168055
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34386

<400> 168055
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168056
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34407

<400> 168056
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ggcaacgaca acagcauggc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaccagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccaccaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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hemagglutinin__InfluenzaA__AEX34473

<400> 168059

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag agcggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagagcgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168061
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<212> RNA
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hemagglutinin__InfluenzaA__AEX34506

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 168062
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<212> RNA
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hemagglutinin__InfluenzaA__AEX34517

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168063
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168064
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEX34539

<400> 168064
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag agcggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgugc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga agagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168065
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<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag agcggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgugc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga agagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168066
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34561

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag agcggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgugc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aucaucacca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga agagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168067
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34572

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag agcggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgugc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga agagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168068
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34583

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168069
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX34594

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 168070
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEX34605

<400> 168070
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 168071
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34616

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgugc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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hemagglutinin__InfluenzaA__AEX34627

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag agcggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgugc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga agagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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uacagaaacc ugcuguggcu gaccggcaag agcggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgugc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga agagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agagaagccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168075
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aagggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaga aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca gcaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168076
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEX34672

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggacaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccaccaccgg cgugagcgcc agcugcagcc acgacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgugc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 168077
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX34683

<400> 168077

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccuaccaca ccaccaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168078
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34757

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccaccaccgg cgugagcgcc agcugcagcc acaacggcgg cagcagcuuc 480

uacaagaacc ugcuguggcu gaccagaaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168079
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX34768

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga cagcagcugg 420

cccaaccaca ccaccaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccagggc 720

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

agcggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168082
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hemagglutinin__InfluenzaA__AEX34801

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcgccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168083
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168084
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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaacagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc accaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 168085
<211> 1698
<212> RNA
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hemagglutinin__InfluenzaA__AEX34845

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu ggugcccaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga gggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168086
<211> 1698
<212> RNA
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hemagglutinin__InfluenzaA__AEX34856

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

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aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168087
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34867

<400> 168087
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu ggugagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugauca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac ccccagaggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga gggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 168088
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168088
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

agcggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168089
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34889

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168090
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34900

<400> 168090
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

agcggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc gugaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcguggag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168091
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34911

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagccag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cugggcagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168092
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34922

<400> 168092
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccugg acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 168093
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34933

<400> 168093
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168094
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX34944

<400> 168094
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

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aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 168102
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

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aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu gaugagcagc 660

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca gccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucggcgugc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
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<212> RNA
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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168118
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX35219

<400> 168118
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caugagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168119
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX35230

<400> 168119
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag agcggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgugc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga agagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168120
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX35241

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168121
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX35263

<400> 168121
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag agcggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgugc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga agagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168122
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX35274

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag agcggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgugc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168123
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX35285

<400> 168123
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168124
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AEX35296

<400> 168124
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168125
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX35307

<400> 168125
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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hemagglutinin__InfluenzaA__AEX35395

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcgac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

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aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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hemagglutinin__InfluenzaA__AEX35472

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgccccccug ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168153
<211> 1701

<212> RNA
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<220>
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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168155
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168155
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

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cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168156
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEX36102

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168157
<211> 1701
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168158
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168159
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX36146

<400> 168159
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ggcgacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168160
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168160
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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcgac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacaagcug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucaa gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

aagugcaaca ucugcaucug a 1701

<210> 168161
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX36179

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168162
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX36190

<400> 168162
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaacugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 168163
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX36201

<400> 168163
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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 168164
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX36212

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga ucagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168165
<211> 1701
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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 168166
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcgac 480

aacagcuucu ucagcaagcu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugccuga agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168167
<211> 1701
<212> RNA
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<220>
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<400> 168167

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aacagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caagaccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168168
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX36256

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168169
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168170
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX36289

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga ucagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168171
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX36300

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168172
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEX36311

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 168173
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<212> RNA
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<220>
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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga ucagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168174
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgccua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168175
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caacgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168176
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168177
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX36377

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168178
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168178
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 168179
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX36399

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168180
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX36410

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168181
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168182
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccagg ugcuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168183
<211> 1701
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168184
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEX36454

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168185
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEX36465

<400> 168185

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168186
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX36476

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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<210> 168187
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEX36487

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcugcac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168188
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEX36498

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<211> 1701

<212> RNA
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aacagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggacaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<211> 1701
<212> RNA
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<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168195
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEX36575

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca agagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

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gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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cugaacggca agauccccu gcagcugggc aacugcaacg uggccggcug gauccugggc 240

aaccccaagu gcgaccugcu gcugaccgcc aacagcugga gcuacaucau cgagaccagc 300

aacagcaaga acggcgccug cuaccccggc gaguucgccg acuacgagga gcugaaggag 360

cagcugagca ccgugagcag cuucgagaga uucgagaucu uccccaaggc caccagcugg 420

cccaaccacg acaccaccag aggcaccacc guggccugca gccacagcgg cgccaacagc 480

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uacaacuacc ugaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<212> RNA
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<212> RNA
<213> Artificial Sequence

<220>
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<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 168205
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168206
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gccugcagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168207
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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<400> 168207
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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168208
<211> 1701
<212> RNA
<213> Artificial Sequence

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168209
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEY69186

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168210
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEY69197

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168211
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEY69208

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168212
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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168213
<211> 1701
<212> RNA
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<220>
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168214
<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168215
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEY69291

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168216
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEY69302

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168217
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEY69313

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168218
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEY69785

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168219
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagcugag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 168220
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168221
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<212> RNA
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<400> 168221

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168222
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<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168223
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168224
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168225
<211> 1701

<212> RNA
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<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168226
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AEY69895

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168227
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AEY69906

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

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aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<220>
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hemagglutinin__InfluenzaA__AFB40601

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccgagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<212> RNA
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hemagglutinin__InfluenzaA__AFB40602

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFB40603

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 168254
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFB40604

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug gacaaggagu ucaaccaccu ggagaagaga 1260

aucggcaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168255
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168256
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFB70145

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 168257
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFB70154

<400> 168257

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacgagaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168258
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFB70156

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168259
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hemagglutinin__InfluenzaA__AFB70158

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 168260
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<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168261
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFB70162

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168262
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFB70167

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 168263
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFB70177

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168264
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<210> 168265
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFB70197

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 168266
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFB70207

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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<211> 1701
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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<210> 168289
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 168297
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<212> RNA
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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaccaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168298
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFB77632

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gaccaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcaaga ucugcaucug a 1701

<210> 168299
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFB77633

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugaa gaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac acccccauca agaacgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168300
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFB77634

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgagaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168301
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFB77635

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agccccugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168302
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFB77636

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa ggccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugaugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168303
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFB77637

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggg cagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 168304
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFB77638

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

uucuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168305
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFB77639

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accaccgccg accagcaggg ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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hemagglutinin__InfluenzaA__AFB77691

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hemagglutinin__InfluenzaA__AFB77692

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hemagglutinin__InfluenzaA__AFB77693

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacaccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccaggacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcgccagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168316
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<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168317
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168318
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcag aauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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<210> 168319
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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gccgccgagc agaccaagcu guaccagaac cccaccaccu acaucagcgu gggcaccagc 660

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ggcagaaugg aguucuucug gaccauccug aagcccaacg acgccaucaa cuucgagagc 780

aacggcaacu ucaucgcccc cgaguacgcc uacaagaucg ugaagaaggg cgacagcacc 840

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<210> 168320
<211> 1722
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFD32428

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cagaucaucc ccaagagcag cuggagcagc cacgaggcca gccugggcgu gagcagcgcc 480

ugccccuacc agggcaagag cagcuucuuc agaaacgugg uguggcugau caagaagaac 540

agcaccuacc ccaccaucaa gagaagcuac aacaacacca accaggagga ccugcuggug 600

cugugggca uccaccaccc caacgacgcc gccgagcaga ccaagcugua ccagaacccc 660

accaccuaca ucagcguggg caccagcacc cugaaccaga gacuggugcc cagaaucgcc 720

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gaguucagcg agguggaggg cagaauccag gaccuggaga aguacgugga ggacaccaag 1320

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aacgccgagg acaugggcaa cggcugcuuc aagaucuacc acaagugcga caacgccugc 1500

aucggcagca ucagaaacgg caccuacgac cacgacgugu acagagacga ggcccugaac 1560

aacagauucc agaucaaggg cguggagcug aagagcggcu acaaggacug gauccugugg 1620

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gaggagagcc ugagacagau ccugagaggc agcggcggca ucgacaagga gagcaugggc 420

uucaccuaca gcggcaucag aaccaacggc gccaccagcg ccugcagaag aagcggcagc 480

agcuucuacg ccgagaugaa guggcugcug agcaacagcg acaacgccga guuccccccag 540

augaccaaga gcuacagaaa ccccagaaac aagcccgccc ugaucaucug gggcgugcac 600

cacagcggca gcgccaccga gcagaccaag cuguacggca gcggcaacaa gcugaucacc 660

gugggcagca gcaaguacca gcagagcuuc acccccagcc ccggcgccag accccaggug 720

aacggccaga gcggcagaau cgacuuccac uggcugcugc uggaccccaa cgacaccgug 780

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauacca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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<212> RNA
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<212> RNA
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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aaagagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168333
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<212> RNA
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<211> 1701
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<210> 168336
<211> 1701
<212> RNA
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cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccacaga aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aaagagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca caucaagagc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168341
<211> 1701
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hemagglutinin__InfluenzaA__AFD63802

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFD63813

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uacgccagcc ugagaagccu gguggccagc agcggcagcc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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hemagglutinin__InfluenzaA__AFD63824

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uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<212> RNA
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uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168360
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ggcaacgaga acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168361
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aaagagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168362
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacaccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caagaacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168363
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aucagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168364
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD64088

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168365
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168365

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

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cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 168366
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD64110

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168367
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD64121

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gccagaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<212> RNA
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<220>
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<211> 1701
<212> RNA
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag uacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aaagagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

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gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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hemagglutinin__InfluenzaA__AFD64381

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaccuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaccuuccug uacgcccagg ccagcggcag aaucaccgug 660

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aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD64827

<400> 168407
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaccuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168408
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFD64828

<400> 168408
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc ccgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168409
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFD64830

<400> 168409
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168410
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFD98095

<400> 168410
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168411
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFD98106

<400> 168411
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168412
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFD98128

<400> 168412
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168413
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFD98139

<400> 168413
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168414
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFD98161

<400> 168414
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168415
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<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg gugcugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168416
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugcug cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168417
<211> 1701
<212> RNA
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<220>
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168418
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFD98205

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168419
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFD98215

<400> 168419

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaugcaaca ucugcaucug a 1701

<210> 168420
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD98226

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 168421
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD98237

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 168422
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD98248

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aacagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168423
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD98259

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agcagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcaggac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168424
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD98270

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugacccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaacac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 168425
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFD98280

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgacagccu gagcaccgcc agaagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 168426
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFD98290

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168427
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD98310

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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<210> 168428
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD98320

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 168429
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD98340

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168430
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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agcagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaggccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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agcagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFD98417

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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<210> 168437
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD98428

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 168438
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFD98439

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 168439
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFD98449

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaaguu ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcaagcu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugagca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168442
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFD98481

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcguga ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168443
<211> 1701
<212> RNA
<213> Artificial Sequence

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<212> RNA
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hemagglutinin__InfluenzaA__AFD98514

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168446
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaccuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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uuccugcugu gcaucgugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag acuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag caucuaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag caucuaccag aacgccgaca ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 168458
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<212> RNA
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<210> 168460
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__AFF57148

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 168461
<211> 1701
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hemagglutinin__InfluenzaA__AFF57160

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accagcgccg accagcagag ccuguaccag aacgaggacg ccuacguguu cgugggcagc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168462
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFF57164

<400> 168462
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacgagaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168463
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFF57168

<400> 168463
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacgagaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168464
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFF57172

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgaggacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168465
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFF57176

<400> 168465
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168466
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFF57184

<400> 168466
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccagaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168467
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFF57188

<400> 168467
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgacg accagcagag ccuguaccag aacgaggacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168468
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFF60787

<400> 168468
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcaccuacc ccaccaucaa gagaagcuac 540

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cugaaccaga gacuggugcc cagaaucgcc accagaagcg aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

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cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

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agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 168469
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG29042

<400> 168469
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccuuc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFG31080

<400> 168473

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 168474
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFG31100

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accugaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 168475
<211> 1701
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<211> 1701
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hemagglutinin__InfluenzaA__AFG31120

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<210> 168477
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AFG31130

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168485
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 168486
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<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 168487
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 168488
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168489
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 168490
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 168491
<211> 1701
<212> RNA
<213> Artificial Sequence

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<400> 168491

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168492
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 168495
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 168496
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 168499
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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cagugcagaa ucugcaucug a 1701

<210> 168500
<211> 1701
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168501
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG31376

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168502
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168503
<211> 1701
<212> RNA
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<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168504
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG31406

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168505
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFG31416

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 168506
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG31426

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 168507
<211> 1701
<212> RNA
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<220>
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<400> 168507
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 168508
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hemagglutinin__InfluenzaA__AFG31446

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168509
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<212> RNA
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hemagglutinin__InfluenzaA__AFG31456

<400> 168509

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168510
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hemagglutinin__InfluenzaA__AFG31466

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168511
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG31486

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168512
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG31496

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168513
<211> 1701

<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168514
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG31516

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 168515
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG31526

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168516
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG31536

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168517
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG31546

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168518
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFG31556

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168519
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG31566

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168520
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFG31586

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168521
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG31596

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168522
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG31606

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168523
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG31616

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168524
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG31626

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 168525
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168526
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168527
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG31656

<400> 168527

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168528
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFG31666

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168529
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG71865

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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agaugcaaca ucugcaucug a 1701

<210> 168530
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG71876

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168531
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG71898

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168536
<211> 1701
<212> RNA
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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168537
<211> 1701
<212> RNA
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aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168539
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG72029

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucau caacgagggc 420

uucaacugga ccggcgugac ccagagcggc ggcagcuacg ccugcaagag aggcagcgac 480

aacagcuucu ucagcagacu gaacuggcug uacgagagcg agagcaagua ccccgugcug 540

aacgugacca ugcccaacaa cggcaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acaaggagca gaccaaccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168540
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccuggugg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagagc 420

uucaacugga ccggcgugac ccagagcggc ggcagcuacg ccugcaagag aggcagcgac 480

aacagcuucu ucagcagacu gaacuggcug uacgagagcg agagcaagua ccccgugcug 540

aacgugacca ugcccaacaa cggcaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acaaggagca gaccaaccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag aacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168541
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccuggugg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagagc 420

uucaacugga ccggcgugac ccagagcggc ggcagcuacg ccugcaagag aggcagcgac 480

aacagcuucu ucagcagacu gaacuggcug uacgagagcg agagcaagua ccccgugcug 540

aacgugacca ugcccaacaa cggcaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acaaggagca gaccaaccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaaaccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga cacagaaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168542
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ucggcgugac ccagagcggc ggcagcugcg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacgagagcg agcagaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ucggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168543
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cggcagauuc gacaagcugu acaucugggg cgugcaccac 600

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gccgugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcgugauccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168544
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168545
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72129

<400> 168545

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggccugagca gcggcaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 168546
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72140

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168547
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG72151

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgaggac 420

uucaacugga ccggcguggc ccagagcggc gagagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacgagagcg acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagagagca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168548
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG72184

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg acuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

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aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg agagagagca gaccagccug uacaucagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168549
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgaggac 420

uucaacugga ccggcguggc ccagagcggc gagagcuacg ccugcaagag aggcagcgug 480

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aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagagagca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168550
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

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aagagcuucu ucagcagacu gaacuggcug cacgagagcg acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagagagca gaccagccug uacaucagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168551
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG72217

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc ggcagcuacg ccugcaagag aggcagcgug 480

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cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugacc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgacauca agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggaccug auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168552
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168553
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG72239

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ggcagcgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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agaugcaaca ucugcaucug a 1701

<210> 168554
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG72272

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168555
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72316

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc ggcagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugacc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgugcccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168556
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFG72339

<400> 168556
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc ggcagcuaca ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagagcg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugacc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168557
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72350

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc agaagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagagcg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugacc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaucugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168558
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72372

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuaca ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168559
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72383

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuucagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccggccugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168560
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72394

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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gccaccaaga gaagccagca gaccgugauc cccaacaucg gcuucagacc cugggugaga 720

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ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccggccugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168561
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72405

<400> 168561
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc aacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgaggac 420

uucaacugga ccggcguggc ccaggacggc ggcagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168562
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72449

<400> 168562
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcuacagc ccccacagaa uccuggacgg caacaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aagggcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcgg cgugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccagcaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168563
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168564
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccggccugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168565
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG72515

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcccca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagaac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

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ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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guggagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168566
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcagcugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168567
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG72581

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168568
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72603

<400> 168568
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caaggagggc 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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agaugcaaca ucugcaucug a 1701

<210> 168569
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72614

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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168570
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG72625

<400> 168570
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaagagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168571
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72636

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc gacaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168572
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72658

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168573
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG72680

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaucau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccagaa gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acagaaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168574
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFG72691

<400> 168574
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuucaagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacgg caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168575
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72713

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuucaagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucagcagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ucagaagcga cgcccccauc gacaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168576
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72724

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgugugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168577
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72735

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

accgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgacaucug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168578
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72757

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcuacg ccugcaagag aagcagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag cauccacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168579
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG72779

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccagaa gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcggcaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168580
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugag caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagcauc uacgcccaga gcagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagccc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168581
<211> 1701
<212> RNA
<213> Artificial Sequence

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<400> 168581

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccugaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168582
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcugcac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acaucaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168583
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72834

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcaucgugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168584
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG72845

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcgac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga gauacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcgugagca gcagaaucag cauccacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168585
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72856

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucac caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacaagcug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168586
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168586
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga agaacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168587
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72922

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ggcgacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaucag aaagagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168588
<211> 1701
<212> RNA
<213> Artificial Sequence

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<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG72933

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcgugag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168589
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga gauucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168590
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG98808

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg uguuccagga cgagaccugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caccgagggc 420

uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccggc 480

agcggcuucu ucagcagacu gaacuggcug accaagagcg gcagcaccua ccccgugcug 540

aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccagcacca accaggagca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccagaa gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagag aggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168591
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG98819

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caccgagggc 420

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagag aggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168592
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFG98830

<400> 168592
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ggcaacgaca agagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caccgagggc 420

uucaccugga ccggcgugac ccagaacggc ggcagcagcg ccugcaagag aggccccggc 480

agcggcuucu ucagcagacu gaacuggcug accaagagcg gcagcaccua ccccgugcug 540

aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugauc 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168593
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG98841

<400> 168593
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ggcaacgaca agagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

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uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccggc 480

agcggcuucu ucagcagacu gaacuggcug accaagagcg gcagcaccua ccccgugcug 540

aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccagaa gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugauc 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168594
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFG98852

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaccugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagggc 420

uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccgac 480

agcggcuucu ucagcagacu gaacuggcug uacaagagcg gcagcaccua ccccgugcug 540

aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg accaggagca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168595
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaccugg 300

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uucaccugga ccggcgugac ccagaacggc ggcagcagcg ccugcaagag aggccccgac 480

agcggcuucu ucagcagacu gaacuggcug uacaagagcg gcagcaccua ccccgugcug 540

aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca gaaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168596
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG98874

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaccugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagggc 420

uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccgac 480

aacggcuucu ucagcagacu gaacuggcug uacaagagcg gcagcaccua ccccgugcug 540

aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg accaggagca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168597
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaccugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagggc 420

uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggcaccgac 480

agcggcuucu ucagcagacu gaacuggcug uacaagagcg gcagcaccua ccccgugcug 540

aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168598
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG98896

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagggc 420

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aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168599
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG98907

<400> 168599

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168600
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG98918

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168601
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG98929

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucaacugc 240

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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ggcaugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaga 840

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<212> RNA
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acccugguga agaccaucac caacgaccag aucgagguga ccaacgccac cgagcuggug 180

cagagcagca gcaccggcaa gaucugcaac aacccccaca gaauccugga cggcaucaac 240

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ugggaccugu ucguggagag aagcaaggcc uucagcaacu gcuaccccua cgacgugccc 360

gacuacgcca gccugagaag ccugguggcc agcagcggca cccuggaguu caucaacgag 420

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agcaccaaga gaagccagca gaccgugauc cccaacgugg gcagcagacc cugggugaga 720

ggccugagca gcagagugag caucuacugg accaucguga agcccggcga cauccuggug 780

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agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcgacaac ccccacagaa uccuggacgg caucaacugc 240

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aacguggcca ugcccaacaa cgacaacagc gacaagcugu acaucugggg cgugcaccac 600

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aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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aacgugacca ugcccaacaa cgacaacagc gacaagcugu acaucugggg cgugcaccac 600

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ggccugagca gcagagugag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168612
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<212> RNA
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acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

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aacgugacca ugcccaacaa cgacaacagc gacaagcugu acaucugggg cgugcaccac 600

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ggccugagca gcagagugag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168613
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcgacaac ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

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aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168614
<211> 1701
<212> RNA
<213> Artificial Sequence

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168615
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggccugagca gcagagugag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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<210> 168616
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG99116

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<210> 168617
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG99127

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagagc 420

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agcaccaaga gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168618
<211> 1701
<212> RNA
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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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agcaccaaga gaaaccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168619
<211> 1701
<212> RNA
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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cgccgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168620
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<212> RNA
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uucaacugga ccggcgugac ccagagcggc ggcagcuacg ccugcaagag aggcagcgac 480

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 168621
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG99182

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagggc 420

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168622
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFG99193

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168623
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG99204

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 168624
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG99215

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

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agaugcaaca ucugcaucug a 1701

<210> 168625
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG99226

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagggc 420

uucaacugga ccggcgugac ccagagcggc ggcagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug uacgagagcg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acaaggagca gaccaaccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugagc 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168626
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFG99237

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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aacgugacca ugcccaacaa cggcaaguuc gagaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccagau acgugagaca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168627
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcgugac ccagagcggc ggcagccacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacgagagcg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccaucaccg acagagagca gaccaaccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuucagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168628
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFG99259

<400> 168628
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccaggug gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcgugac ccagagcggc ggcagcuacg ccugcaagag aggcagcgug 480

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aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagagagca gaccaaccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168629
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168630
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG99281

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168631
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG99292

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168632
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFG99303

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cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgaca gcuuccagaa cgagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcgugac ccagagcggc ggcagcuacg ccugcaagag aggcagcgug 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagcugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168634
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

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aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<211> 1701
<212> RNA
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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168637
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

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<210> 168638
<211> 1701
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<210> 168639
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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<210> 168640
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168657
<211> 1701

<212> RNA
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agcagcagca ccggcagaau cugcgacagc ccccacagag ugcuggacgg caagaacugc 240

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aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168660
<211> 1701
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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168661
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hemagglutinin__InfluenzaA__AFG99644

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<210> 168663
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFG99666

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<210> 168664
<211> 1701
<212> RNA
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aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168666
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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168668
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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168669
<211> 1701
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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

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<210> 168670
<211> 1701
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<213> Artificial Sequence

<220>
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<210> 168671
<211> 1701
<212> RNA
<213> Artificial Sequence

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<400> 168671

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<210> 168672
<211> 1701
<212> RNA
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<220>
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cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg acuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

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aagagcuucu ucagcagacu gaacuggcug cacgagagcg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168673
<211> 1701
<212> RNA
<213> Artificial Sequence

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc ggcagcuacg ccugcaagag aggcagcgug 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccagagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168674
<211> 1701
<212> RNA
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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168675
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg acuuccagaa caaggagugg 300

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168676
<211> 1701
<212> RNA
<213> Artificial Sequence

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168677
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<210> 168678
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 168679
<211> 1701
<212> RNA
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<220>
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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacaagcug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168696
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcaagau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg acuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccagagcggc gacagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacgagagcg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagagagca gaccagccug uacaucagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168697
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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uucaacugga ccggcguggc ccagaacggc gacagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacgagagcg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca caucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168698
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

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aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168699
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cacugcgacg acuuccagaa caaggagugg 300

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168700
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168701
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00098

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168702
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00109

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aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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<210> 168703
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFH00120

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuucagacc cugggugaga 720

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agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccggccugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc accauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168704
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00131

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuaca ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168705
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacaucagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168706
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00164

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaugg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccagaacggc gacagcuacg ccugcaagag aggcagcgug 480

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aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168707
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00175

<400> 168707

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga agagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

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agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168708
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00186

<400> 168708
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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uucaacugga ccggcguggc ccaggacggc ggcagcuacg ccugcaagag aggcagcgug 480

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168709
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00197

<400> 168709
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agaugcaaca ucugcaucug a 1701

<210> 168710
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00208

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcguga ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168711
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00219

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc aacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgaggac 420

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ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168712
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<212> RNA
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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuucagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccggccugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168714
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168715
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc aacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgaggac 420

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168716
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00274

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168717
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00285

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agaugcaaca ucugcaucug a 1701

<210> 168718
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168718
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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<210> 168719
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00307

<400> 168719
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc ggcagcuacg ccugcaagag aggcagcgug 480

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aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugacc cccaacaucg gcagcagacc cugggugaga 720

ggccagagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168720
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc ggcagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggccagagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168721
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agcagcagca ccggcagaau cugcgacagc caccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagcauc uacgugagag ccagcggcag agugaccgug 660

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agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

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ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168722
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caaggagggc 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168724
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFH00362

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

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aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168725
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168725

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caaggagggc 420

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<210> 168726
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00395

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caaggagggc 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacggcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168727
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00417

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168728
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00428

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcccca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagaac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcaa ggugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccgacaucg gcuacagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

guggagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcuucgugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168729
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00439

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

agcaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168730
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacggc ccccacagaa ucaucgacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcaga gcagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168731
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00461

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcccca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagaac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgugagaa gcagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccgacaucg gcuacagacc cugggugaga 720

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agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcggcug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

guggagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168732
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00472

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcuacg ccugcaagag aagaagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168733
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00483

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168734
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00494

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcccca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagaac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

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ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

guggagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168735
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00505

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcaucaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168736
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168736
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaagagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168737
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00527

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcuacg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag cauccacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168738
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00538

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agaagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcuacg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168739
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00549

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgcccagg cccccggcag agugaccgug 660

agcaccagaa gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcaucaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc agcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168740
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00560

<400> 168740
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gugaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga ggccgagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168741
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFH00571

<400> 168741
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gugaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugga ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168742
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00582

<400> 168742
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg cccccggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacugca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgccagcauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168743
<211> 1701
<212> RNA
<213> Artificial Sequence

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<400> 168743

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcgac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168744
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFH00604

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agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcgac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168745
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00615

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg acaucgagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168746
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00626

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aaagagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168747
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00637

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcacca acaacgacca gaucagccug uacacccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168748
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00648

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168749
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00659

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcgac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcggcug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168750
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00670

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcugcac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa ggagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua cagcgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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ggccugagca gcggcaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

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<210> 168756
<211> 1701
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hemagglutinin__InfluenzaA__AFH00736

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 168757
<211> 1701
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hemagglutinin__InfluenzaA__AFH00747

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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<210> 168758
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFH00758

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acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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uucaacugga ccggcguggc ccagagcggc gagagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacgagagcg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168759
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFH00769

<400> 168759
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccagagcggc gagagcuaca ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacgagagcg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagagagca gaccagccug uacaucagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168760
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00780

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcgacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168761
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH00791

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

ggcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caaggagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuaca ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168762
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00802

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgccagcauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168763
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00813

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168764
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH00824

<400> 168764
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168765
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH01407

<400> 168765
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168766
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH34940

<400> 168766
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccgg cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168767
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH34961

<400> 168767
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccgcc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168768
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH34968

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccgcc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168769
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH34975

<400> 168769
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga acggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168770
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH74464

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168771
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH74465

<400> 168771
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168772
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFH74477

<400> 168772
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccaggcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168773
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH74488

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168775
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168776
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca agagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168777
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gccugcagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168778
<211> 1701
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168779
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168781
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH74576

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168782
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH74587

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168783
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH74598

<400> 168783
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168784
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH74609

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168785
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH74620

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168786
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH74631

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caccaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168787
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH74642

<400> 168787
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168788
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH74653

<400> 168788
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168789
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH74664

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168790
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168790
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168791
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH74686

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gccugcagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagcugag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168792
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH74697

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gccugcagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagcugag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168793
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168794
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH74719

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168795
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFH74730

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168796
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH74741

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168797
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH74752

<400> 168797

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168799
<211> 1701
<212> RNA
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168800
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gccugcagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168801
<211> 1701

<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168802
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgug 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168803
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFH74818

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcggcug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgug 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168804
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFH74829

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcggcug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgug 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg uuccugugga ucagcuucgc caucagcugc 1620

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<210> 168805
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFH74840

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

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<210> 168806
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 168809
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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168810
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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168811
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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

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<210> 168812
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hemagglutinin__InfluenzaA__AFH74917

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 168813
<211> 1701
<212> RNA
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168816
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168817
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<212> RNA
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

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agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168818
<211> 1701
<212> RNA
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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<210> 168819
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<212> RNA
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hemagglutinin__InfluenzaA__AFJ05142

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<210> 168820
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<212> RNA
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168821
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ11706

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168822
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ11728

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168824
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ20171

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168825
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ20182

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168826
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ74386

<400> 168826
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ccgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag gagagcugga gcuacaucgc cgagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccaa gggcgugacc gccagcugca gccacaacgg caagagcagc 480

uucuacaaga accugcugug gcugaccgag aagaacggcc uguaccccaa ccugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucggcg accagagagc caucuaccac accgagaacg ccuacgugag cgugaugagc 660

agccacuaca gcagaagauu cacccccgag aucgccaaga gacccaaggu gagagaccag 720

gagggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

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ggcgccauca acagcagccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cggcgagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 168827
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168828
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ74418

<400> 168828
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168829
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ74437

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168830
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ74448

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcggcccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168831
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ74459

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ccgcccccu gcagcugggc aacugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag gagagcugga gcuacaucgc cgagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccaa gggcgugacc gccagcugca gccacaacgg caagagcagc 480

uucuacaaga accugcugug gcugaccgag aagaacggcc uguaccccaa ccugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucggcg accagagagc caucuaccac accgagaacg ccuacgugag cguggugagc 660

agccacuaca gcagaagauu cacccccgag aucgccaaga gacccaaggu gagaaaccag 720

gagggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcaugggc gagugcgacg ccaagugcca gaccccccag 900

ggcgccauca acagcagccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucaac ggcaucacca acaaggugaa cagcaucauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaacaagcu ggagagaaga 1260

auggagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugaa gaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag caaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168832
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ74470

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcuacg ccugcaagag aagaagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccaga ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168833
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ74492

<400> 168833

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa caagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcaucaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucaa gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168834
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ74525

<400> 168834
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccaggacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcaucaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168835
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ74535

<400> 168835
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa caagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucaa gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168836
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ74560

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcgac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccaga ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcggccc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcccc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

guggagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168837
<211> 1701

<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFJ74634

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168838
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gacaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168839
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ74673

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagaaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gacaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168840
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ74674

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaga 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcagc ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168841
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ74694

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gacaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168842
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFJ74695

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uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccaggacggc accagcagcg ccugcaagag aagaagcgac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcaagaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcccc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168843
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ74727

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaagcggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168844
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ74743

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gacaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aucaucaaca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168845
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ74744

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168846
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ74760

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gacaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168847
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ74761

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168848
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ74779

<400> 168848
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gacaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168849
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ74780

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168850
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ74804

<400> 168850
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168851
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ74819

<400> 168851

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucaaccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168852
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ74842

<400> 168852
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168853
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ75036

<400> 168853
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gaacagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168854
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ75047

<400> 168854
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168855
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ75058

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 168856
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ75069

<400> 168856
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagagc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccaccaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168857
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ75091

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga ucagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgaccugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168858
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ75449

<400> 168858
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168859
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ75460

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccgug gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168860
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ75517

<400> 168860
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga ccuacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgacc agaugacccu guaccacaag aagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga acagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagac ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168861
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ75560

<400> 168861
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguucguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaga aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168862
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ75571

<400> 168862
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agagaaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168863
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ75593

<400> 168863
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ggcaacgaca gcagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168864
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ75615

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ugcgugggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgaggugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168865
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ75630

<400> 168865
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168866
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ75641

<400> 168866
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168867
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ75651

<400> 168867
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcgacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 168868
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ75662

<400> 168868
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168869
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ75673

<400> 168869

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga ccuacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga acagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagac ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 168870
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ76119

<400> 168870
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168871
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ76131

<400> 168871
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168872
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ76155

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa ggccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168873
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ76186

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc accaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168874
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ76203

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168875
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ76213

<400> 168875
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccacagca aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168876
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77408

<400> 168876
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcaacagc ccccacagaa uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caaggagggc 420

uucaacugga ccggcguggc ccaggacggc aagagcuaca gcugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168877
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77430

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc aacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caaggagggc 420

uucaacugga ccggcguggc ccaggacggc aagagcuaca gcugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168878
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ77440

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac cagcgagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168879
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77451

<400> 168879
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcuacg ccugcaagag aagaagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacggcaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168880
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ77462

<400> 168880
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168881
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77473

<400> 168881
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168882
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77484

<400> 168882
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168883
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77495

<400> 168883
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccag cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcuucg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucaccga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgugugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168884
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77506

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168885
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcaacg ccugcaagag aagaagcaug 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgcccagg ccagcggcag agugaccgug 660

agcacccaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ucagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caugagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168886
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77528

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caaggagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168887
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77550

<400> 168887

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagacca gaggcaucuu cggcgccauc gccggcuuca ucgagaacgg cugggagggc 1080

augguggacg gcugguacgg cuucagacac cagaacagcg agggcaccgg ccaggccgcc 1140

gaccugaaga gcacccaggc cgccaucaac cagaucaacg gcaagcugaa cagacugauc 1200

gagaagacca acgagaaguu ccaccagauc gagaaggagu ucagcgaggu ggagggcaga 1260

auccaggacc uggagaagua cguggaggac accaagaucg accuguggag cuacaacgcc 1320

gagcugcugg uggcccugga gaaccagcac accaucgacc ugaccgacag cgagaugaac 1380

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uacgaccacg acguguacag agacgaggcc cugaacaaca gauuccagau caagggcgug 1560

gagcugaaga gcggcuacaa ggacuggauc cuguggauca gcuucgccau cagcugcuuc 1620

cugcugugcg uggugcugcu gggcuucauc auguggccu gccagaaggg caacaucaga 1680

ugcagcaucu gcaucuga 1698

<210> 168888
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ77561

<400> 168888
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcuacg ccugcaagag aagaagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucuacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168889
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77572

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gagaagacca acgagaaguu ccaccagauc gagaaggagu ucagcgaggu ggagggcaga 1260

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gagcugcugg uggcccugga gaaccagcac accaucgacc ugaccgacag cgagaugaac 1380

aagcuguucg agagaaccaa gaagcagcug agagagaacg ccgaggacau gggcaacggc 1440

ugcuucaaga ucuaccacaa gugcgacaac gccugcaucg gcagcaucag aaacggcacc 1500

uacgaccacg acguguacag agacgaggcc cugaacaaca gauuccagau caagggcgug 1560

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ugcagcaucu gcaucuga 1698

<210> 168890
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77583

<400> 168890
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gugaaggaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccacauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168891
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ77594

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gugaaggaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccacauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168892
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ77605

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gccgugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168893
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ77616

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gugaaggaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccacauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgccagcauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168894
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaaggaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccacauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgccagcauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168895
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caccaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168896
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77649

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucaa gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168897
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77660

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168898
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ77671

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168899
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hemagglutinin__InfluenzaA__AFJ77682

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168900
<211> 1701
<212> RNA
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gugaacgaca acagcaccgc cacccugugc cugggccacc acaccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgacaacauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugga ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaacu ucgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168901
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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168902
<211> 1701
<212> RNA
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gugaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugga ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168903
<211> 1701
<212> RNA
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<220>
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gugaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgacaacauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugga ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168904
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFJ77737

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168905
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168905

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168906
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ77759

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168907
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFJ77781

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cagcgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168908
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168909
<211> 1701

<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168910
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<212> RNA
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hemagglutinin__InfluenzaA__AFJ77814

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168911
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ77825

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168912
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ77836

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168913
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ77847

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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<210> 168914
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ77858

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcacccaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga caugcugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacaagcug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccuguucu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168915
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ77869

<400> 168915
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168916
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 168916
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168917
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ77902

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucggccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga caugcugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168918
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ77913

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcaggac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga caugcugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168919
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ77924

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

guggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaugg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168920
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77935

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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cacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaccuuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168921
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ77946

<400> 168921
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga caugcugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg aucaucugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168922
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ77957

<400> 168922
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168923
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168924
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga gaagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168925
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFJ77990

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgagua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 168926
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hemagglutinin__InfluenzaA__AFJ78001

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 168927
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AFJ78012

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168928
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78023

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 168929
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78034

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 168930
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78045

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau gggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

aagugcaaca ucugcaucug a 1701

<210> 168931
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78056

<400> 168931
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168932
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78067

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaga 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168933
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78078

<400> 168933
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168934
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ78089

<400> 168934
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga ucagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgaccugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168935
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78100

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168936
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78111

<400> 168936
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168937
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78122

<400> 168937
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaga 840

agcagcauca ugagaagcga cgcccccauc gacaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucagaaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168938
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78144

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168939
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ78155

<400> 168939
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168940
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78166

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168941
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78177

<400> 168941

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168942
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78188

<400> 168942
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168943
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78210

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168944
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78221

<400> 168944
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168945
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78232

<400> 168945
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaacg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168946
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ78243

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgccaagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccgug ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga cacaagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168947
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78254

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168948
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78265

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168949
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78276

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168950
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78287

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaugg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168951
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78309

<400> 168951
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgugaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccagcaac 600

aucggcgacc agagagccau cuaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168952
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ78320

<400> 168952
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 168953
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78331

<400> 168953
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgugaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aacggcaacc ugaucgcccc cugguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgugaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

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aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aucggcgacc agagagccau cuaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168962
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<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaacccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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<212> RNA
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hemagglutinin__InfluenzaA__AFJ78441

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccguggac aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucau ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168965
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<212> RNA
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hemagglutinin__InfluenzaA__AFJ78463

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gggcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucau ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168966
<211> 1698
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFJ78474

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcu acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168967
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78485

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccaccaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gagaaccuga acaagaaggu ggaggacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 168968
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78496

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccaccaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucggcggcc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168969
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hemagglutinin__InfluenzaA__AFJ78518

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccaccaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 168970
<211> 1698
<212> RNA
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<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168971
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78540

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168972
<211> 1698
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFJ78551

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168973
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78562

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccacccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ugaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168974
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78573

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

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gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

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gacuacccca aguacagcga ggaggccaag cugagcagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168975
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ78584

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccagaaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168976
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78595

<400> 168976
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acagagagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 168977
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hemagglutinin__InfluenzaA__AFJ78617

<400> 168977

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acgacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccc acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 168978
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hemagglutinin__InfluenzaA__AFJ78628

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 168979
<211> 1698
<212> RNA
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hemagglutinin__InfluenzaA__AFJ78639

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccagc 600

aucagcaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 168980
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<212> RNA
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hemagglutinin__InfluenzaA__AFJ78650

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 168981
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AFJ78661

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168982
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFJ78681

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 168983
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78691

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 168984
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78701

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168985
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78711

<400> 168985
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agagagugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168986
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78721

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168987
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78731

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcagcauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168988
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ78741

<400> 168988
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168989
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78751

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168990
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78761

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 168991
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFJ78771

<400> 168991
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 168992
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hemagglutinin__InfluenzaA__AFJ78781

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
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hemagglutinin__InfluenzaA__AFJ78801

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cagugcagaa ucugcaucug a 1701

<210> 168996
<211> 1701
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 168997
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<212> RNA
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa caccggcagc 840

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<210> 168999
<211> 1701

<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169000
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFJ78861

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaga 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169001
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78881

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169002
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78891

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169003
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78901

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169004
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78911

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169005
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFJ78921

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169006
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFJ97567

<400> 169006
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagcuu ccccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169007
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14115

<400> 169007
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<212> RNA
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hemagglutinin__InfluenzaA__AFK14131

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AFK14139

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AFK14148

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169011
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14157

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169012
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFK14166

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169013
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14175

<400> 169013

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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cagugcagaa ucugcaucug a 1701

<210> 169014
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14184

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 169015
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14193

<400> 169015
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169016
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14202

<400> 169016
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169017
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14211

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169018
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14220

<400> 169018
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgccagcag cuucgagaga uacgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169019
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14229

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169020
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14238

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169021
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14247

<400> 169021
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169022
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14272

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaccggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169023
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14314

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169024
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 169024
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169025
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14332

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169026
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14341

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaag acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169027
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14350

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169028
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14358

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcgccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169029
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFK14395

<400> 169029
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaga acggcaugug cugccccaga gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169030
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14431

<400> 169030
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuuccugg acuacgagga gcugagaaag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169032
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169033
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hemagglutinin__InfluenzaA__AFK14536

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccuac 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169034
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFK14571

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169035
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFK14586

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcaucug a 1701

<210> 169036
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFK14595

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 169037
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFK14612

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169038
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14621

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169039
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14630

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagagccg accugcagag caucaaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169040
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14639

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aggccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169041
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14661

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169042
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169043
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14678

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169044
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFK14688

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucc acgacgagga gcugagaaag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa ggccggcagc 840

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ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 169045
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFK14697

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169046
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14713

<400> 169046
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169047
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169048
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14731

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagaaag 360

cagcugagca gcgugagcag cuucgagaga guggagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169049
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14740

<400> 169049

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169050
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFK14749

<400> 169050
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169051
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14756

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169052
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14764

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169053
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14779

<400> 169053
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugggcggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__AFK14788

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagaaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagaaag 360

cagcugagca gcgugagcag cuucgagaga guggagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuacgagaga uacgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169057
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__AFK14831

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucagcg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169058
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFK14839

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169059
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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cagugcagaa ucugcaucug a 1701

<210> 169060
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFK14868

<400> 169060
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169061
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14884

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169062
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14892

<400> 169062
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169063
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK14901

<400> 169063
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169064
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14910

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169065
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFK14919

<400> 169065
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169066
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK14929

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169067
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK25599

<400> 169067

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169068
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK25601

<400> 169068
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgugacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169069
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK25603

<400> 169069
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169070
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK25605

<400> 169070
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugagaagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169071
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74526

<400> 169071
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accugaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169072
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74534

<400> 169072
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169073
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74544

<400> 169073
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169074
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74554

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169075
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74564

<400> 169075
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169076
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74575

<400> 169076
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169077
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74585

<400> 169077
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169078
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFK74595

<400> 169078
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accugaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169079
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74605

<400> 169079
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169080
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74615

<400> 169080
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169081
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74625

<400> 169081
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169082
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74635

<400> 169082
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169083
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFK74645

<400> 169083
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169084
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74655

<400> 169084
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169085
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK74665

<400> 169085

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169086
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 169086
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169087
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK74685

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169088
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK74695

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169089
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK74705

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169090
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK74715

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 169091
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74725

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169092
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74735

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169093
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74745

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169094
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK74755

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169095
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFK74765

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169096
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 169096
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169097
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74785

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169098
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74795

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169099
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74805

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169100
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK74815

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169101
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFK74825

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169102
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK74835

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169103
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74845

<400> 169103

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169104
<211> 1701
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169105
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169106
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74915

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169107
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK74925

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggugccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169108
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFK74935

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169109
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169110
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFK74955

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169111
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK74965

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169112
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK74975

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169113
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169114
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFK74995

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169115
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK75005

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169116
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK75015

<400> 169116
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcgugug a 1701

<210> 169117
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFK75025

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169118
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK75035

<400> 169118
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169119
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFK75045

<400> 169119
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169120
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK75055

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169121
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK75065

<400> 169121

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169122
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK75075

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169123
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFK75085

<400> 169123
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169124
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<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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hemagglutinin__InfluenzaA__AFK75105

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169127
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFK77867

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169128
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacgagaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 169130
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFK77897

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gugaccguga cccacagcau caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<212> RNA
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agcaacuaca acggcagauu cacccccgag aucgccgcca gacccaaggu gagaaaccag 720

cccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFM68965

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ggccugagca gcggcaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

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ugccccagau acaucaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagccuggc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169147
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM71846

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag gagggcagcu accccaagcu gaagaacagc 540

uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca ccccagcaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

gccaucaaca gcagccugcc cuaccagaac auccaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

cuggagagca ugggcaucua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 169148
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM71857

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cuggugaaga ccaucaccga cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg uguuccagaa cgagaccugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caccgagggc 420

uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccggc 480

agcggcuucu ucagcagacu gaacuggcug accaagagcg gcagcaccua ccccgugcug 540

aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccagcacca accaggagca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccagaa gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagag aggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169149
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM71868

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucagacug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169150
<211> 1701
<212> RNA
<213> Artificial Sequence

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucagacug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuacagacc cagagugaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169151
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM71890

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acacccugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaag 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacagccu gcugcccgcc agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcgccug cuaccccggc gacuucaucg acuacgagga gcugaaggag 360

cagcugagca gcgugagcag ccuggagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca acacccugaa gggcgugacc gccagcugca gccacggcgg caagagcagc 480

uucuacagaa accugcugug gcugaccaag accgaggaca gcuaccccaa gcugagcaac 540

agcuacguga acaacaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

agcagcgacg agcagcagag ccuguaccac aacgugaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgcca gacccaaggu gagaaaccag 720

cccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaccggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcaugcac gagugcaaca ccaagugcca gacccccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccaguuca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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auggagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgaccu gaacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac aagugcaugg agagcgugag aaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169152
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM71901

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaag 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacagccu gcugcccgcc agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcgccug cuaccccggc gacuucaucg acuacgagga gcugaaggag 360

cagcugagca gcgugagcag ccuggagaga uucgagaucu uccccaagga gagcagcugg 420

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agcuacguga acaacaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

agcagcgacg agcagcagag ccuguaccac aacgugaacg ccuacgugag cguggugagc 660

agcaacuaca acggcagauu cacccccgag aucgccgcca gacccaaggu gagaaaccag 720

cccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaccggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcaugcac gagugcaaca ccaagugcca gaccccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccaguuca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 169153
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM71923

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agcaccaaga gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca gaaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169154
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM71934

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agcggcuucu ucagcagacu gaacuggcug uacaagagcg gcagcaccua ccccgugcug 540

aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca gaaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169155
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaccugg 300

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agcggcuucu ucagcagacu gaacuggcug uacaagagcg gcagcgccua ccccgugcug 540

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agcaccaaga gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFM71956

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cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaccugg 300

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agcggcuucu ucagcagacu gaacuggcug uacaagagcg gcagcgccua ccccgugcug 540

aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg accaggagca gaccaaccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169157
<211> 1704
<212> RNA
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ggcaacgaca acaacagcac cgccacccug ugccugggcc accacgccgu gcccaacggc 120

acccugguga agaccaucac caacgaccag aucgagguga ccaacgccac cgagcuggug 180

cagagcagca gcaccggcaa gaucugcaac aacccccaca gaauccugga cggcaucaac 240

ugcacccuga ucgacgcccu gcugggcgac ccccacugcg acggcuucca gaacgagaag 300

ugggaccugu ucguggagag aagcaaggcc uucagcaacu gcuaccccua cgacgugccc 360

gacuacgcca gccugagaag ccugguggcc agcagcggca cccuggaguu caucaacgag 420

ggcuucaacu ggaccggcgu gacccagaac ggcggcagca acgccugcaa gagaggcccc 480

gacagcggcu ucuucagcag acugaacugg cuguacaaga gcggcagcac cuaccccgug 540

cagaacguga ccaugcccaa caacgacaac agcgacaagc uguacaucug gggcgugcac 600

caccccagca ccgacaagga gcagaccaac cuguacgugc aggccagcgg caaggugacc 660

gugagcacca agagaagcca gcagaccauc auccccaacg ugggcagcag acccugggug 720

agaggccuga gcagcagaau cagcaucuac uggaccaucg ugaagcccgg cgacauccug 780

gugaucaaca gcaacggcaa ccugaucgcc cccagaggcu acuucaagau gagaaccggc 840

aagagcagca ucaugagaag cgacgccccc aucggcaccu gcagcagcga gugcaucacc 900

cccaacggca gcauccccaa cgacaagccc uuccagaacg ugaacaagau caccuacggc 960

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gugaucgaga agaccaacga gaaguuccac cagaucgaga aggaguucag cgagguggag 1260

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aacggcugcu ucaagaucua ccacaagugc gacaacgccu gcaucggcag caucagaaac 1500

ggcaccuacg accacgacgu guacagagac gaggcccuga acaacagauu ccagaucaag 1560

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<210> 169158
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFM71989

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acaaggacca gaucuuccug uacacccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169159
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72010

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169160
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72021

<400> 169160
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag aagagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaagcaca acgugaccag aggcgugacc gccagcugca gccacaaggg caagagcagc 480

uucuacagaa accugcugug gcugaccgag aagaacggca gcuaccccaa ccugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucgagg accagaagac caucuacaga aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagaggccag 720

gccggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccuggcac gccuucgccc ugaacagagg cuucggcagc 840

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ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

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cagugcagaa ucugcaucug a 1701

<210> 169161
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72032

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169162
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72043

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

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cccagcaccg acaaggagca gaccaaccug uacaucagag ccagcggcag agugaccgug 660

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169163
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72054

<400> 169163
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugcaag 180

cugaagggca ucgccccccu gcagcugggc aagugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag aagagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaagcaca acgugaccaa gggcgugacc gccgccugca gccacaaggg caagagcagc 480

uucuacagaa accugcugug gcugaccgag aagaacggca gcuaccccaa ccugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucgagg accagaagac caucuacaga aaggagaacg ccuacgugag cguggugagc 660

agccacuaca acagaagauu cacccccgag aucgccaaga gacccaaggu gagaaaccag 720

gagggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcauggac gagugcgacg ccaagugcca gacccccccag 900

ggcgccauca acagcagccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169164
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72065

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugcaag 180

cugaagggca ucgccccccu gcagcugggc aagugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag aagagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaagcaca acgugaccaa gggcgugacc gccgccugca gccacaaggg caagagcagc 480

uucuacagaa accugcugug gcugaccgag aagaacggca gcuaccccaa ccugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucgagg accagaagac caucuacaga aaggagaacg ccuacgugag cguggugagc 660

agccacuaca acagaagauu cacccccgag aucgccaaga gacccaaggu gagaaaccag 720

gagggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcauggac gagugcgacg ccaagugcca gaccccccag 900

ggcgccauca acagcagccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169165
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72087

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

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aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagccc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169166
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72098

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

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aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169167
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72109

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169168
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFM72120

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 169169
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72131

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

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uucaacugga acggcguggc ccagagcggc gagagcuacg ccugcaagag aggcagcgug 480

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aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169170
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72142

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc ggcagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagagacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccagagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169171
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72153

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcggcagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgaggac 420

uucaacugga ccggcguggc ccaggacggc ggcagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugacc cccaacaucg gcagcagacc cugggugaga 720

ggccagagca gcagaaucgg caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169172
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72164

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcccca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagaac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccgacaucg gcuacagacc cugggugaga 720

ggccagagca gcagaaucag cauccacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

guggagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169173
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72175

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcccca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagaac 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccaaccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccgacaucg gcuacagacc cugggugaga 720

ggccagagca gcagaaucag cauccacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

guggagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169174
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72197

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcuacg ccugcaagag aagaagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccaucaccg acagcgagca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuacagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

aagugcaaca ucugcaucug a 1701

<210> 169175
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72208

<400> 169175

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aacagcuucu ucagcagacu gaacuggcug caccagcuga aguacagaua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169176
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72219

<400> 169176
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aacagcuucu ucagcagacu gaacuggcug caccagcuga aguacagaua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaagagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169177
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72230

<400> 169177
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag aagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgugaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 169178
<211> 1701
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<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72246

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugag caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagcauc uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagccc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169179
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72257

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gugaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagcauc uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcggcaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccacauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccaacaccg acagcgacca gaucagcauc uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcggcaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169181
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72279

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gugaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccacauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcaagca cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169182
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aggacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169183
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72301

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuacagacc cagagugaga 720

gacaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169184
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72312

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acagcgacca gaucaaccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuacagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 169185
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72323

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acagcgacca gaucaaccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuacagacc cagagugaga 720

gacaacccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169186
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcugcac 600

cccggcaccu acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169187
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72345

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acagcgacca gaucagccug uacacccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuucagacc cagagugaga 720

gacaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169188
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucaaccug uacgugcagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucagcagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169189
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucaaccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucagcagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169190
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72378

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccagcuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuacagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169191
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuacagacc cagagugaga 720

aacaacccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169192
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72400

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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcugcac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169193
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72411

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aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg acuucgagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<212> RNA
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hemagglutinin__InfluenzaA__AFM72422

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuucagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacgccgag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuucagacc cagagugaga 720

aacaacccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacgccgag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169196
<211> 1701
<212> RNA
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gauccugcug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuucagacc cagagugaga 720

aacaacccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacgccgag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701

<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccagcuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuucagacc cagagugaga 720

aacaacccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacgccgag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169198
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuucagacc cagagugaga 720

aacaacccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacgccgag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169199
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72488

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccagcuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgagca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcuucagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169200
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72499

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccagcuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169201
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72521

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcag acugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag ccuggagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFM72532

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcag acugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag ccuggagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcag acugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag ccuggagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 169204
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcag acugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag ccuggagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cgaggugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 169205
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFM72565

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169206
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72576

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169207
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72799

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca aggccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcggccugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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<210> 169208
<211> 1698
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFM72810

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca aggccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcggccugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

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gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

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cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 169209
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72821

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca aggccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcggccugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaugacccu guaccacaag gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgacg uguggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugagcagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 169210
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<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72852

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaccuu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169211
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72862

<400> 169211

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaac 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaccuu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169212
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72872

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169213
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа ccagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169214
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72894

<400> 169214
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccagcuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaugca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169215
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72916

<400> 169215
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcggcug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg uuccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 169216
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72927

<400> 169216
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaccagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ucggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169217
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72938

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaccagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaacccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ucggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169218
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72949

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccagcuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaccagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaacccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ucggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169219
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72960

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaagugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaccagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ucggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169220
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM72971

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaagugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccagcuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaccagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ucggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169221
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72982

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cagcgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acaucaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagccuggc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169222
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFM72993

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagcg ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcugcac 600

cccggcaccu acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169223
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM73004

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcugcac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uucuuccugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169224
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM73015

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169225
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<220>
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hemagglutinin__InfluenzaA__AFM73025

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgacg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM73035

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgacg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169227
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169228
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFM73055

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagagaaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcugguggag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169229
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM73065

<400> 169229

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169230
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFM73477

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag aagagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaagcaca acgugaccag aggcgugacc gccagcugca gccacaaggg caagagcagc 480

uucuacagaa accugcugug gcugaccgag aagaacggca gcuaccccaa ccugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucgagg accagaagac caucuacaga aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagaggccag 720

gccggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccuggcac gccuucgccc ugaacagagg cuucggcagc 840

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ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169231
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM78567

<400> 169231
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccaccaacg accugugcua ccccggcagc uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc ugggcagccc cagcuucuuc 480

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cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

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cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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<210> 169232
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM78646

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug auccuguggg gcgugcacca cccccccaac 600

aucggcgacc agagaacccu guacuacacc gagaacgccu acgugagcgu ggugagcagc 660

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uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc aagagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__AFN17381

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 169240
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaaggcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<212> RNA
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<400> 169247

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 169256
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hemagglutinin__InfluenzaA__AFN17580

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 169257
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN17586

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169258
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169259
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN17605

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169260
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN17615

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cagugcagaa ucugcaucug a 1701

<210> 169261
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN17625

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169262
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN17635

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169263
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN17645

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cagcugagca gcgugagcag cuucgagaga guggagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN17725

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gaccccaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169272
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN17735

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169273
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN17742

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169274
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN17748

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169275
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN17757

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169276
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169277
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN17774

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169278
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN17783

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169281
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169282
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcgag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN17833

<400> 169283

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccaacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 169284
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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<210> 169285
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFN17853

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169286
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN17863

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc ggcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accugaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacguga acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 169294
<211> 1701
<212> RNA
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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacguga acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 169302
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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18049

<400> 169302
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169303
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18059

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac gccugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169304
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18078

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169305
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18088

<400> 169305
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169306
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18098

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgccg uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169307
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18105

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaacugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169308
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18107

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169309
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18117

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac gccugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169310
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18119

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169311
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18121

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccagaagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169312
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 169312
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac gccugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169313
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18135

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcagcauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169314
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18137

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169315
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18139

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcaggg ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169316
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18141

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccagaagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169317
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFN18148

<400> 169317
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169318
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18155

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169319
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18157

<400> 169319

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169320
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18159

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cagcaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169321
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18164

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugaucgu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcaacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagc ugaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccgugu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169322
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18171

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acagcggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaagug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugaag gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169323
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18176

<400> 169323
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169324
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18183

<400> 169324
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugauggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169325
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18195

<400> 169325
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg cagagaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__AFN18224

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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hemagglutinin__InfluenzaA__AFN18243

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169333
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18245

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169334
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18255

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169335
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169336
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18267

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169337
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18269

<400> 169337

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169338
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18271

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169339
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18273

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169340
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18280

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accugaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug gugaagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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hemagglutinin__InfluenzaA__AFN18420

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169357
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18430

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169358
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN18440

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169359
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18450

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169360
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18460

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169361
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18470

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169362
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18480

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169363
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18490

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169364
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18497

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169365
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18512

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169366
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFN18519

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169367
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18521

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cggcgaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169368
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18528

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169369
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18531

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169370
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18543

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169371
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18545

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugau ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 169372
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hemagglutinin__InfluenzaA__AFN18550

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 169373
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18557

<400> 169373

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 169374
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagaa ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18561

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169376
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18563

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169377
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AFN18565

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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cagugcagaa ucugcaucug a 1701

<210> 169378
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN18570

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgug agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169379
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18580

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagaa ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accuggugguu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

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<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

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<210> 169385
<211> 1701
<212> RNA
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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 169386
<211> 1701
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hemagglutinin__InfluenzaA__AFN18634

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 169387
<211> 1701
<212> RNA
<213> Artificial Sequence

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169395
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18721

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169396
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18725

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169397
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFN18735

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga cccugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169398
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN18742

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169399
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN18747

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169400
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN18757

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggccgu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169401
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18767

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169402
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFN18774

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN18776

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169406
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN18789

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169407
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN18799

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169408
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN18809

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 169409
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18816

<400> 169409

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169410
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18818

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169411
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18820

<400> 169411
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aacugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169412
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18822

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169413
<211> 1701

<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFN18824

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

agacuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169414
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18826

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169415
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18828

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169416
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18830

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggccgu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 169417
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18832

<400> 169417
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169418
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18834

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169419
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18849

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacguggacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169420
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFN18856

<400> 169420
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169421
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18858

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169422
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18860

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa uggacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169423
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18865

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169424
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18875

<400> 169424
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg cccagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169425
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18885

<400> 169425
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccaaccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

acccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcaaga ucugcaucug a 1701

<210> 169426
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18892

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169427
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18894

<400> 169427

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169428
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18903

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169429
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18910

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169430
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18912

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169431
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN18917

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcggca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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<210> 169432
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN18927

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169433
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18937

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169434
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18952

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacagaaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169435
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18957

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169436
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18964

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169437
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18974

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcaugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caagaaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgacgaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169438
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169439
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN18982

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac caacagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169440
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18984

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169441
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN18986

<400> 169441
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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<210> 169447
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hemagglutinin__InfluenzaA__AFN19036

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169449
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN19053

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 169450
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19063

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169451
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN19070

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169452
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hemagglutinin__InfluenzaA__AFN19076

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169453
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169454
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN19088

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 169455
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN19097

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169456
<211> 1701
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<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169457
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19113

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169458
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19119

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169459
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19125

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169460
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19134

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169461
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFN19144

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169462
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19154

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169463
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19164

<400> 169463

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169464
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19174

<400> 169464
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169465
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19184

<400> 169465
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169466
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19194

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169467
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19203

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169468
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19213

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169469
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19223

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169470
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19233

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169471
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19243

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcag gacugcaaca ccaccugcca gacccccaag 900

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169472
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19250

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169473
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19259

<400> 169473
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169474
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFN19269

<400> 169474
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169475
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19279

<400> 169475
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169476
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19286

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggugagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169477
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19295

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169478
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19305

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169479
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFN19315

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169480
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19325

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169481
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19335

<400> 169481

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169482
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19344

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169483
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19351

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ggcaacgaca acagcauggc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacgug 1680

agaugcaaca ucugcaucug a 1701

<210> 169484
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFN19355

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169485
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19357

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169486
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19361

<400> 169486
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169487
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19363

<400> 169487
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aucagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169488
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169489
<211> 1701
<212> RNA
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<220>
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgugaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169490
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFN19369

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgugaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169491
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFN19373

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169492
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169493
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19377

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 169494
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19379

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 169495
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19381

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 169499
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hemagglutinin__InfluenzaA__AFN19389

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169500
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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<210> 169501
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<220>
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hemagglutinin__InfluenzaA__AFN19393

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 169502
<211> 1701
<212> RNA
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<220>
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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 169503
<211> 1701

<212> RNA
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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hemagglutinin__InfluenzaA__AFN19401

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169506
<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgugaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 169507
<211> 1701
<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga gcggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 169508
<211> 1701
<212> RNA
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 169509
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN19411

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 169510
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<220>
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 169511
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19415

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcguga ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169512
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169513
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgugaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169515
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucagaaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169516
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 169517
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFN19443

<400> 169517

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 169518
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFN19445

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169519
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19447

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169520
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19451

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaacggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169521
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19453

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca ggugaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169522
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19455

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169523
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19457

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169524
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19459

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169525
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19461

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169526
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19465

<400> 169526
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caucggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169527
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19467

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169528
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca ggugaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169529
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19471

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169530
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19473

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcggcagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169531
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19475

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169532
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19477

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169533
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19479

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169534
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19483

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169535
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFN19485

<400> 169535

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169536
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19487

<400> 169536
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169537
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19491

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169538
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19493

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169539
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19495

<400> 169539
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169540
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19497

<400> 169540
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169541
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19499

<400> 169541
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169542
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19501

<400> 169542
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgugaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169543
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19503

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169544
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19507

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169545
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19509

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgugaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169546
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFN19513

<400> 169546
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169547
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19515

<400> 169547
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgugaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169548
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19517

<400> 169548
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169549
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19519

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169550
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19521

<400> 169550
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169551
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgugaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169552
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19527

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169553
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 169553

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169554
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19531

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169555
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19533

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169556
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19535

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169557
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19537

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169558
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19539

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augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169559
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19543

<400> 169559
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169560
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19545

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ggcagcgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuucaagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169561
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19547

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169562
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19549

<400> 169562
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca agggcgagau cugcaacagc ccccaccaga uccuggacgg cggcaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg acaucgagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169563
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19551

<400> 169563
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169564
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFN19553

<400> 169564
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169565
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19555

<400> 169565
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169566
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19557

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169567
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19559

<400> 169567
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169568
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19561

<400> 169568
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca ggugaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169569
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19563

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169570
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19565

<400> 169570
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169571
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19567

<400> 169571

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169572
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19569

<400> 169572
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169573
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19571

<400> 169573
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacagccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucagaaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcccc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuacaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gaccuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169574
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19573

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua cagcgcccug 540

aacgugacca ugcccaacaa ggagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaugca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169575
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19575

<400> 169575
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacaac ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169576
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19577

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgugaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169577
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19579

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgugaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169578
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19581

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgugaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169579
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19583

<400> 169579
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169580
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19587

<400> 169580
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca cgagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169581
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19589

<400> 169581
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169582
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa cggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169583
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19593

<400> 169583
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgugaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169584
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19595

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169585
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19599

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169586
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19601

<400> 169586
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169587
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19607

<400> 169587
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169588
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19609

<400> 169588
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169589
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19611

<400> 169589

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucgugg agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169590
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19613

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169591
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19617

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169592
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19619

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcaagcc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169593
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19623

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169594
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19629

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgugaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169595
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19631

<400> 169595
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gagaacgacu acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcacc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169596
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19633

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccauc 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169597
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19635

<400> 169597
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caucaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169598
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFN19637

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caucaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169599
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169600
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169601
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFN19643

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caucaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169602
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19645

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169603
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19647

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugaagagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 169604
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19649

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169605
<211> 1701
<212> RNA
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169606
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169607
<211> 1701
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca ggugaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169608
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<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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<210> 169609
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169610
<211> 1701
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 169611
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN19674

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 169612
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFN19676

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169613
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19678

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca ggugaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169614
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19682

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccaac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

aagugcaaca ucugcaucug a 1701

<210> 169615
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19684

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169616
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19686

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacaucccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169617
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19688

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169618
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggaccuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169619
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19692

<400> 169619
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 169620
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19694

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcccca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169621
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19700

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaga 420

uucaacugga gcggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169622
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19702

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagagg caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169623
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19709

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169624
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19719

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aacccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169625
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19730

<400> 169625

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169626
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169627
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19748

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169628
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19757

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169629
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19768

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169630
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19781

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgccg uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169631
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19791

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169632
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19806

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169633
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19808

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aacagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac caacagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaacagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169634
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19814

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169635
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19816

<400> 169635
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169636
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFN19821

<400> 169636
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaagcu gaagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__AFN19831

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169638
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169639
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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<210> 169640
<211> 1701
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hemagglutinin__InfluenzaA__AFN19875

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgagaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169641
<211> 1701
<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 169642
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFN19905

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<212> RNA
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hemagglutinin__InfluenzaA__AFN19915

<400> 169643

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcgaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<212> RNA
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<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFN19922

<400> 169644
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaga 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccag gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169645
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169646
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19941

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aucagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169647
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN19951

<400> 169647
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169648
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19966

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169649
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19972

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acaacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 169650
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19978

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 169651
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN19983

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggaccauc guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169655
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<212> RNA
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hemagglutinin__InfluenzaA__AFN20012

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169656
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 169657
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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<210> 169658
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

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<210> 169659
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN20034

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169660
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN20040

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169661
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN20046

<400> 169661

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169662
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN20052

<400> 169662
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169663
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN20061

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169664
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN20076

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgacu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169665
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN20081

<400> 169665
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugau ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcagaugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggugau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169666
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN20092

<400> 169666
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 169667
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN20099

<400> 169667
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aucagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169668
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN20112

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcaagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccaca accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aacggcaaca gcuaccccaa gcugaacacc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169669
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hemagglutinin__InfluenzaA__AFN87924

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcacc 540

agcuacauca acgacaagag aaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169670
<211> 1701
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hemagglutinin__InfluenzaA__AFN87926

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169671
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN87927

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagag aaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169672
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169673
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN87929

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 169674
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN87930

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 169675
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFN87931

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag caucuaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169683
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aucagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcacc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169684
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169685
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__AFN87947

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcacc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169686
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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<210> 169687
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN87951

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc guguucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169688
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgc caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accugaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 169689
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFN87955

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169690
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aucagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcacc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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cugaagggca ucgccccccu gcagcugggc aacugcagca ucgccggcug gauccugggc 240

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cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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agccacuaca acagaagauu cacccccgag aucgccaaga gacccaaggu gagagaccag 720

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cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccaa gggcgugacc gccagcugca gccacaacgg caagagcagc 480

uucuacaaga accugcugug gcugaccgag aagaacggcc uguaccccaa ccugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucggcg accagagagc caucuaccac accgagaacg ccuacgugag cguggugagc 660

agccacuaca gcagaagauu cacccccgag aucgccaaga gacccaaggu gagaggccag 720

gagggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

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ggcgccauca acagcagccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169699
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ccgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag gagagcugga gcuacaucgc cgagaccccc 300

aaccccgaga acggcaccug cuaccccggc ugcuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccaa gggcgugacc gccagcugca gccacaacgg caagagcagc 480

uucuacaaga accugcugug gcugaccgag aagaacggcc uguaccccaa ccugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucagag accagagagc caucuaccac accgagaacg ccuacgugag cguggugagc 660

agccacuaca gcagaagauu cacccccgag aucgccaaga gacccaaggu gagaggccag 720

gagggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

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ggcgccauca acagcagccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucuucaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgugaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccagcaac 600

aucagagacc agagagccau cuaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag aggccaggag 720

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aacggcaacc ugaucgcccc cugguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aacggccugu accccaaccu gagcaagagc 540

uacgugaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccagcaac 600

aucagagacc agagagccau cuaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag aggccaggag 720

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uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 169702
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFO64901

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ccgccccccu gcagcugggc aacugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag gagagcugga gcuacaucgc cgagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccaa gggcgugacc gccagcugca gccacaacgg caagagcagc 480

uucuacaaga accugcugug gcugaccgag aagaacggcc uguaccccaa ccugagcaag 540

agcuacguga acaacaagaa gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucggcg accagagagc caucuaccac accgagaacg ccuacgugag cguggugagc 660

agccacuaca gcagaagauu cacccccgag aucgccaaga gacccaaggu gagaaaccag 720

gagggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucgagagc 840

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ggcgccauca acagcagccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

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aaccuguacg agaaggugaa gaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag caaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169703
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccaagaag aacggccugu accccaaccu gagcaagagc 540

uacgugaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccagcaac 600

aucggcgacc agagaaccau cuaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 169704
<211> 1698
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<220>
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hemagglutinin__InfluenzaA__AFO65027

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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uacgugaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 169705
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<212> RNA
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hemagglutinin__InfluenzaA__AFO65038

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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hemagglutinin__InfluenzaA__AFO66136

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ccgccccccu gcagcugggc aacugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag gagagcugga gcuacaucgc cgagaccccc 300

aaccccaaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga cagcagcugg 420

cccaaccaca ccgugaccaa gggcgugacc gccagcugca gccacaacgg caagagcagc 480

uucuacaaga accugcugug gcugaccggc aagaacggcc uguaccccaa ccugagcaag 540

agcuacguga acaagaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaugggcg accagagagc caucuaccac aaggagaacg ccuacgugag cgugcugagc 660

agccacuaca gcagaagauu cacccccgag aucgccaaga gacccaaggu gagagaccag 720

gagggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ucagcaacgc cagcaugggc gagugcgacg ccaagugcca gacccccccag 900

ggcgccauca acagcagccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucaac ggcaucacca acaaggugaa cagcaucauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaacaagcu ggagagaaga 1260

auggagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugaa gaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag caaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169708
<211> 1698
<212> RNA
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<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag ggcagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggg cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaugagc 540

uacgugaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cugguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 169709
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<212> RNA
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hemagglutinin__InfluenzaA__AFO66169

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccagc 300

aaccccgaga acggcaccug cuaccccggc uacuucaccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 169710
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<212> RNA
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hemagglutinin__InfluenzaA__AFO66180

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggg cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaugagc 540

uacgugaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag aaaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 169711
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFO66191

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggg cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaugagc 540

uacgugaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 169712
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFO66202

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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aucggcgacc agagaacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 169713
<211> 1698
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

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aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgugc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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hemagglutinin__InfluenzaA__AFO66246

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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hemagglutinin__InfluenzaA__AFP33324

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ccgccccccu gcagcugggc aacugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag gagagcugga gcuacaucgc cgagaccccc 300

aaccccaaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga cagcagcugg 420

cccaaccaca ccgugaccaa gggcgugacc gccagcugca gccacaacgg caagagcagc 480

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agcuacguga acaagaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaugggcg accagagagc caucuaccac aaggagaacg ccuacgugag cgugcugagc 660

agccacuaca gcagaagauu cacccccgag aucgccaaga gacccaaggu gagagaccag 720

gagggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag caaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169718
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hemagglutinin__InfluenzaA__AFP33325

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gauccccaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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cccagccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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uacagcaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 169719
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<212> RNA
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<210> 169720
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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<210> 169721
<211> 1707
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cugcugagca acagcgacaa cgccgccuuc ccccagauga ccaagagcua cagaaacccc 540

agaaacaagc ccgcccugau caucuggggc gugcaccaca gcggcagcgc caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa guaccagcag 660

agcuucaccc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugcugcugga ccccaacgac accgugaccu ucaccuucaa cggcgccuuc 780

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cugcccuucc agaacaucaa ccccagaacc gugggcaagu gccccagaua cgugaagcag 960

accagccugc ugcuggccac cggcaugaga aacgugcccg agaaccccaa ggacagaaag 1020

agcagacaca gaagaaccag aggccuguuc ggcgccaucg ccggcuucau cgagaacggc 1080

ugggagggcc ugaucgacgg cugguacggc uucagacacc agaacgccca gggcgagggc 1140

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agacugaucg acaagaccaa ccagcaguuc gagcugaucg acaacgaguu cagcgagauc 1260

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uacaacgccg agcugcuggu ggccauggag aaccagcaca ccaucgaccu ggccgacagc 1380

gagaugaaca agcuguacga gagagugaga aagcagcuga gagagaacgc cgaggaggac 1440

ggcaccggcu gcuucgagau cuuccacaag ugcgacgacc agugcaugga gagcaucaga 1500

aacaacaccu acgaccacac ccaguacaga gccgagagcc ugcagaacag aauccagauc 1560

gaccccguga agcugagcag cggcuacaag gacaucaucc ugugguucag cuucggcgcc 1620

agcugcuucc ugcugcuggc caucgccaug ggccuggugu ucaucugcau caagaacggc 1680

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<212> RNA
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hemagglutinin__InfluenzaA__AFR68153

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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<210> 169723
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<212> RNA
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hemagglutinin__InfluenzaA__AFR68163

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gugaccguga cccacagcgc caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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<210> 169724
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFR68173

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 169725
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFR84675

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169726
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 169727
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFR84694

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169728
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFR84704

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169729
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFR84714

<400> 169729
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169732
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<212> RNA
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169734
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169735
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169736
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFR84794

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169737
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFR84804

<400> 169737
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169738
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFR84814

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169739
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFR84824

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169740
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFR84834

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169741
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFR84844

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ugcacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169742
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFR84854

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169743
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFR84864

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169744
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AFR84874

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169745
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFR84893

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169746
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFR84903

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169747
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFR84913

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169748
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFR84923

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169749
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFV53205

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gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agauacagcc ugugcuaccc cggcagccug aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga gacacuucga gaaggugaga auccugccca aggacagaug gacccagcac 420

accaccaccg gcgacagcaa ggccugcgcc gugagcggca agcccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggccccgac uaccccgugg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaucga cgaggccgag 600

cagagagagc uguaccagaa gguggcacc uacgugagcg ccagcaccag cacccugaac 660

aagagaagca uccccgagau cgccgccaga cccgagguga acggccugag aagcagaaug 720

gaguucagcu ggacccugcu ggacgugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccugggcaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

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cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgag 1380

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uaccacaagu gcgacgacga gugcaucaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaagaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 169750
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFV53216

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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

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cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca cccccgacau cgccaccaga cccaagguga acggccaggg cggcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccugggcaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

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acccaguucg aggccgugga gaaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

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aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcaucu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 169751
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFV53227

<400> 169751

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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

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ggcauccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agauacagcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacggcug gacccagcac 420

aagaccgacg gcggcagcaa ggccugcgcc gugagcggca aggccagcuu cuucagaaac 480

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aagagaagca cccccgagau cgccgccaga cccgagguga acggccuggg cagcagaaug 720

gaguucagcu ggacccugcu ggacgugugg gacaccauca acuucgagag caccggcaac 780

cugguggccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccugggcaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

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auccaguucg aggccguggg caaggaguuc agcaaccugg agaagagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

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aaguacgagg aggagagcaa gcugaagaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaucg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagagug 1680

ugcaucuga 1689

<210> 169752
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFV53238

<400> 169752
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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agauacagcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcau ggccugcgcc gugagcggca agcccagcuu cuucagaaac 480

augguguggc ugaccaccaa gggccccaac uaccccgugg cccagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgaggccgag 600

cagagagccc uguaccagaa gguggggcacc uacgugagcg ccagcaccag cacccuguac 660

aagagaagca uccccgagau cgccgccaga cccaagguga acggccuggg cagcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugguggccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agaagagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacaacga gugcauggac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 169753
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFV53249

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ggcuaccacg ccaacaacag caccgagacc guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agauacagcc ugugcuaccc cggcagccug aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaga auccugccca aggacagaug gaccaaccac 420

accaccaccg gcggcagcaa ggccugcgcc gugagcggcg agcccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggccccaac uaccccgugg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgaggccgag 600

cagagagccc uguaccagaa gguggcacc uacgugagcg ccagcaccag cacccuguac 660

aagagaagca uccccgagau cgccgccaga cccaagguga acggccuggg cagcagaaug 720

gaguucagcu ggacccugcu gaacgugugg gacaccauca acuucgagag caccggcaac 780

cugguggccc ccgaguacgg cuucaagauc agcaagagag gcagaagcgg caucaugaag 840

accgagggca cccugggcaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc aacaaccugg agaagagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgag 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaagaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucauggugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 169754
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFV53260

<400> 169754
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca aggccccccu gcagcugggc aacugcaaca ucgccggcug ggugcugggc 240

aaccccgagu gcgagagccu gcugagcaac agaagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc gacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaaccaca ccaccagagg cgugaccgcc gccugccccc acgccaugaa gagcagcuuc 480

uacaagaacc ugguguggcu gaccgaggcc aacggcagcu accccaaccu gagcagaagc 540

uacgugaaca accaggagaa ggaggugcug gugcuguggg gcgugcacca ccccagcaac 600

aucgaggacc agagaacccu guacagaaag gacaacgccu acgugagcgu ggugagcagc 660

aacuacaaca gaagauucac ccccgagauc gccaagagac ccaaggugag aggccagagc 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

accggcaacc ugaucgcccc cugguacgcc uucgcccuga gcagaggccc cggcagcggc 840

aucaucacca gcaacgcccc ccuggacgag ugcgacacca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac auccaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcaccaa gcugagaaug gugaccggcc ugagaaacau ccccagcuuc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

auggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaga aacaacgcca aggagcuggg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 169755
<211> 1689

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFV53271

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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gauuccugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agauacagcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacggcug gacccagcac 420

accaccaccg gcggcagcau ggccugcgcc gugagcggca agcccagcuu cuucagaaac 480

augguguggc ugaccgagaa gggccagaac uaccccgugg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgaggccgag 600

cagagagccc uguaccagaa gguggggcacc uacgugagcg ccagcaccag cacccugaac 660

aagagaagca cccccgagau cgccgccaga cccaagguga acggccuggg cagcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugguggccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaaca ucccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agaagagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacaacga gugcauggac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 169756
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFV53282

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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcauccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

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cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca cccccgagau cgccaccaga cccaagguga acggccuggg cagcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagcuggaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacgu gaucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 169757
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFV53293

<400> 169757
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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaagaacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

aaguacagcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacggcug gacccagcac 420

accaccaacg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggccccaac uaccccgugg ccaagggcag cuacaacaac 540

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gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugguggccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg cgugaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

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ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agaagagacu ggagaaccug 1260

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cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcauggac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 169758
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFV53304

<400> 169758
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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagca gaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

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aagagaagca cccccaacau cgccaccaga cccaagguga acggccuggg cagcagaaug 720

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cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

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accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

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acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

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cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

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uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

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aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 169759
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFV53314

<400> 169759
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ggcuaccacg ccaacaacag caccgagacc guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agaaacggcc ugugcuaccc cggcaacuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcca ggccugcgcc gugagcggca accccagcuu cuucagaaac 480

augguguggc ugaccgagaa ggagagcaac uaccccgugg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaucga cgagaccgag 600

cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca cccccgagau cgccaagaga cccaagguga acggccuggg cagcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca ccuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

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acccagaagg ccuucgacgg caucaccaac aaggugaacg ccgugaucga gaagaucaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

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uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 169760
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFV53325

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ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggcagcaac uacaccgugg ccaagggcag cuacaacaac 540

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cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugagcaccag cacccugaac 660

aagagaagca cccccgagau cgccaccaga cccaagguga acggccuggg cagcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

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acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 169761
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hemagglutinin__InfluenzaA__AFV53336

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ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agauacagcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcaccugga gaaggugaag auccugccca aggacggcug gacccagcac 420

gagaccgacg gcggcagcaa ggccugcgcc gugagcggca agcccagcuu cuucagaaac 480

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cagagagccc uguaccagaa gguggcacc uacgugagcg ccagcaccag cacccugaac 660

aagagaagca cccccgagau cgccgccaga cccgagguga gcggccuggg cagcagaaug 720

gaguucagcu ggacccugcu ggacgugugg gacaccauca gcuucgagag caccggcaac 780

cugguggccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccugggcaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

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acccaguucg aggccguggg caaggaguuc agcaaccugg agaagagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaau ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaagaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaucg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 169762
<211> 1701
<212> RNA
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 169763
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169764
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFX96359

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169765
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFX96366

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 169766
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFX96383

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169767
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169769
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hemagglutinin__InfluenzaA__AFX96418

<400> 169769

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169771
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169772
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169773
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169774
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFX96468

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 169775
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 169780
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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<210> 169781
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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<210> 169782
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169783
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169784
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFX96568

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169785
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFX96578

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169786
<211> 1701
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hemagglutinin__InfluenzaA__AFX96588

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169787
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFX96598

<400> 169787

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169788
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFX96608

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169789
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFX96618

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 169790
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFX96628

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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cagugcagaa ucugcaucug a 1701

<210> 169791
<211> 1701

<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accuggugug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugauggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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<210> 169797
<211> 1701
<212> RNA
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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169798
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169799
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AFX96728

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169800
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFX96738

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacca cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169801
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AFX96748

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugau cgagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169802
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFX96758

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169803
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFX96768

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aucagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169804
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFX96778

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 169805
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFX96788

<400> 169805

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169806
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFX96798

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169807
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hemagglutinin__InfluenzaA__AFX96808

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169809
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AFX96828

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 169810
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hemagglutinin__InfluenzaA__AFX96838

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169811
<211> 1701
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hemagglutinin__InfluenzaA__AFX96856

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169812
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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<210> 169813
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hemagglutinin__InfluenzaA__AFX96914

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<210> 169814
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hemagglutinin__InfluenzaA__AFX96924

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagagauu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169815
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFX96934

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169816
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169817
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AFY24162

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169818
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFY24195

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169819
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AFY24217

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169820
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGB08294

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaucaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucguga uggagagaaa cgccggcagc 840

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<210> 169821
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB08295

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaagag aaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaac cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169822
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB08296

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaac cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 169823
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB08297

<400> 169823

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcgag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaac cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169824
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB08298

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccag acugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaac cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccagcu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169825
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB08301

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accgugguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169826
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB08343

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169827
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB08362

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 169828
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB12986

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggaccauc guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 169829
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13006

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169830
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGB13016

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaucggca accuggugu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcgccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169831
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169832
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13036

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169833
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13048

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169834
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagggcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169835
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13082

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 169836
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGB13105

<400> 169836
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169837
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGB13125

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169838
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agccugugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169840
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AGB13159

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccagccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169841
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13170

<400> 169841

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 169842
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13180

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 169843
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13190

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 169844
<211> 1701
<212> RNA
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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgugaagagc 480

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agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169845
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13210

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169846
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13220

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aucagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169847
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGB13230

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169848
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AGB13240

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169849
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AGB13250

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169850
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AGB13260

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cagcaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 169851
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGB13270

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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cagugcagaa ucugcaucug a 1701

<210> 169852
<211> 1701
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accaacgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacggcc agggcagcgg cuacgccgcc 1140

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gugaccguga cccacagcgu gaaccugcug gaggugaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169856
<211> 1701
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hemagglutinin__InfluenzaA__AGB13320

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcgccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169857
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGB13330

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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<210> 169858
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 169859
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<210> 169860
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaugcugg ugcugcugga gaacgagaag acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169861
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13380

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa ccccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169862
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13390

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169863
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13400

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169864
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13410

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169865
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13420

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169866
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13430

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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cagugcagaa ucugcaucug a 1701

<210> 169867
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGB13440

<400> 169867
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169868
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGB13450

<400> 169868
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169869
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGB13460

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169870
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<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169871
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13480

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169872
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13490

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169873
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13500

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggguggc ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169874
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13520

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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<210> 169875
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AGB13530

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau caacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169876
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

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agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 169881
<211> 1701

<212> RNA
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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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<210> 169882
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<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGB13620

<400> 169884
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169885
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13630

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169886
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13640

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169887
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB13650

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcuga uccugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169888
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGB13660

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169889
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGB13721

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169890
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGB13731

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169891
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGB51356

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gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugggcggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu gcugaccgug agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcugguggag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacguga acaacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acagaaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca ugaacagagg cagcggcagc 840

ggcaucauca ucagcgacgc ccccgugcac gacugcaaca ccaagugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug agaaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 169892
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<220>
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hemagglutinin__InfluenzaA__AGB97269

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aucaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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<210> 169893
<211> 1701
<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169894
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGB97288

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccaaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169895
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB97292

<400> 169895

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 169896
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB97300

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169897
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGE89267

<400> 169897
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgagaagagc 480

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<210> 169898
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGE89277

<400> 169898
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgagaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

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accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 169899
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGE89287

<400> 169899
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugcug cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cugauccugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169901
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGE89308

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169902
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<212> RNA
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hemagglutinin__InfluenzaA__AGE89318

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169903
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGE89329

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169904
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGE89340

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169905
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGE89350

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aacagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaugcaaca ucugcaucug a 1701

<210> 169906
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGE89361

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169907
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGE89371

<400> 169907
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug gugaagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169909
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AGE89392

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169910
<211> 1701
<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgagaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaacaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 169911
<211> 1701
<212> RNA
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<220>
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaccuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169912
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGE89730

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169913
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGE89740

<400> 169913

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaugcaaca ucugcaucug a 1701

<210> 169914
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGE89751

<400> 169914
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169915
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGE89762

<400> 169915
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagcg ccggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169916
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

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<210> 169917
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 169918
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169919
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169920
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<212> RNA
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hemagglutinin__InfluenzaA__AGF44897

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

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aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 169921
<211> 1701
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 169922
<211> 1701
<212> RNA
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169923
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<212> RNA
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hemagglutinin__InfluenzaA__AGF44902

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169924
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169925
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGF44904

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169926
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaacac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169927
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGF44906

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169928
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGF44908

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169929
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169930
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGF44910

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<220>
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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 169937
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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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<210> 169938
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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169939
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<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169940
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGF44921

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169941
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AGG13411

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaaaccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169942
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169943
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGG13459

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169944
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGG13495

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 169945
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGG13507

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169946
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13519

<400> 169946
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

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agagugcagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169947
<211> 1701
<212> RNA
<213> Artificial Sequence

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169948
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg acaucgagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169949
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<212> RNA
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<400> 169949

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169950
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169951
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga cagacccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169952
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccagcga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 169953
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGG13627

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 169954
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGG13639

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcacca acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169955
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGG13651

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169956
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13663

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169957
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13675

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169958
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13687

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169959
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13711

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169960
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGG13723

<400> 169960
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169961
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13735

<400> 169961
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169962
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13747

<400> 169962
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169963
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169964
<211> 1701
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 169965
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ugggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 169966
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169967
<211> 1701
<212> RNA
<213> Artificial Sequence

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<400> 169967

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aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 169968
<211> 1701
<212> RNA
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<220>
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<400> 169968
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 169969
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGG13831

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169970
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGG13855

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169971
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGG13867

<400> 169971
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcaagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaugg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169972
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13879

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169973
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13891

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169974
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13903

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugcug cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169975
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13927

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169976
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13939

<400> 169976
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga cagacccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169977
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13962

<400> 169977
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagggc uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccgagagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169978
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 169978
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169979
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169980
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG13997

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169981
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGG14009

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169982
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG14021

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169983
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG14033

<400> 169983
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 169984
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG14318

<400> 169984
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169985
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGG14330

<400> 169985

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ucagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169986
<211> 1701
<212> RNA
<213> Artificial Sequence

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagcg ccagcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 169987
<211> 1704
<212> RNA
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccaccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcggc 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccacag caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

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<210> 169988
<211> 1707
<212> RNA
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccauc 300

cccgccaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcaac 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc ugggcaagcc cagcuucuuc 480

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cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

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cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

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aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 169989
<211> 1704

<212> RNA
<213> Artificial Sequence

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagaa ccugcugauc cugugggca uccaccacag caacgacgcc 600

gccgagcaga ucaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

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agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga aggagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

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cugcagugca gaaucugcau cuga 1704

<210> 169990
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGI02567

<400> 169990
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

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aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

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agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

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agccugcagu gcagaaucug caucuga 1707

<210> 169991
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGI02568

<400> 169991
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

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cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

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accgagcaga ucaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

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agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

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aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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<210> 169992
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGI60301

<400> 169992
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

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ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

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cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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<210> 169993
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ72861

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ggcggcgagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agaagaccgu ggaccugggc cagggcggcc ccagaggcac caucaccggc 240

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aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 169994
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ73327

<400> 169994
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accaccagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca uccccgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gcuggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgagauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169995
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGJ73329

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacgc ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169996
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 169996
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caaggugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169997
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ73333

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169998
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ73335

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagccca gagacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 169999
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ73337

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170000
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ73339

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170001
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ73341

<400> 170001
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170002
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGJ73343

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gugaccguga cccacagcgu gaaccugcug gaggacaagc agaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170003
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGJ73345

<400> 170003

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgaggacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcaacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170004
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGJ73347

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170005
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGJ73349

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170006
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGJ73351

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaagau gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170007
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGJ73353

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170008
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ73355

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccacc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170009
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGJ73357

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170010
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ73361

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccagc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucuuca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170011
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ73363

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170012
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ73365

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170013
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ73367

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcuggc ccuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcguggcc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcag gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170014
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGJ73369

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgccgaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170015
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ73371

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170016
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGJ73373

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagcca ccccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170017
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGJ73375

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccgagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170018
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGJ73377

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccagcugcc ccagagccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucaaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca aggaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170019
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca gcaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcuguucg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

gaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170020
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGK62991

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170021
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGK62993

<400> 170021

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc agcaagugca acagcgccug caucaccacc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugga gcugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170022
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGK62995

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccggccc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170023
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGK62997

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cugcggcgcc 960

ugcgccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccgugu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag agagcaggcc 1140

gccgccuucc agagcaccca ggccgccauc gaccagauca ucggcaagcu gaacagacug 1200

aucggcgaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagaga 1260

agaauccagg cccuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugga gcugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170024
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGK62999

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170025
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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cuggugcacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacggccug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag agagcaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagaga 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170026
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccggccc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170027
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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cuggugcacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacggccug acccaccuga acuucaagua ccccgcccug 540

gacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag agagcaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170028
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170029
<211> 1701
<212> RNA
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acccugaucg acgcccugcu gggcgacccc cagugcgacg gccugcagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170030
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGK63011

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170031
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGK63013

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

gacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgcccugc agagcaccca ggccgccauc gaccagauca ccggcaagcu gaacagacug 1200

aucggcgaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg cccuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugga gcugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170032
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 170032
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 170038
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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<210> 170039
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<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugauca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 170040
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGK63033

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccugaucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170041
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170042
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugca accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gcccagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170043
<211> 1701

<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa gaagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugaccc ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc agcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugga gcugccagaa gggcaacauc 1680

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<210> 170044
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<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccgaggugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170045
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGK63043

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170046
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGK63045

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170047
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGK63047

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccgccugcca gacccccgag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170048
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGK82158

<400> 170048
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170049
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGK84857

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauca ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170050
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGK84860

<400> 170050
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agaugaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170051
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGK84863

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agaagaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170052
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL07713

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga ccagaagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cggcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcugguggag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag acuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170053
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09731

<400> 170053
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170054
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09732

<400> 170054
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170055
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09734

<400> 170055
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170056
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09735

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucagcaucug a 1701

<210> 170057
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09736

<400> 170057

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170058
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09737

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170059
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09739

<400> 170059
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcagcugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170060
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09740

<400> 170060
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170061
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09741

<400> 170061
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170062
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09742

<400> 170062
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagacccaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga gaagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcagca ucugcaucug a 1701

<210> 170063
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09744

<400> 170063
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170064
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09745

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga cgugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacaccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170065
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09746

<400> 170065
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170066
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09747

<400> 170066
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170067
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09748

<400> 170067
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170068
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGL09749

<400> 170068
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccguggac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170069
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09750

<400> 170069
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170070
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09751

<400> 170070
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170071
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09753

<400> 170071
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170072
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09754

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

cugcugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170073
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09756

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170074
<211> 1701
<212> RNA
<213> Artificial Sequence

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gaucugcaag 180

cugagaggcg uggcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaac 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac caccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170075
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09760

<400> 170075

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170076
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09761

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170077
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09762

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170078
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09763

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170079
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09764

<400> 170079
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170080
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGL09765

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170081
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGL09766

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagauccu gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170082
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170083
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09769

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170084
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09770

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170085
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09771

<400> 170085
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacaucua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170086
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGL09772

<400> 170086
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170087
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09773

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccgaggugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170088
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09774

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170089
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09775

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170090
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09776

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170091
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09777

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170092
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09778

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170093
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09779

<400> 170093

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ggcaacaaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170094
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09780

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucga caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucagccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170095
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09781

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170096
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09782

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170097
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09783

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

guggugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaacccaga accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170098
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09785

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170099
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09786

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucga caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaag 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucagccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170100
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09787

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170101
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09788

<400> 170101
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170102
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09789

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170103
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGL09790

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170104
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacaugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucagccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170105
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGL09792

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170106
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09794

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cacccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170107
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09795

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170108
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09797

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170109
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09798

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaacu ucgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170110
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09799

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170112
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<212> RNA
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hemagglutinin__InfluenzaA__AGL09801

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170114
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hemagglutinin__InfluenzaA__AGL09803

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170115
<211> 1701

<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGL09804

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170116
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGL09805

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 170117
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09806

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

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<210> 170118
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09807

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170119
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09808

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacgugg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170120
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09809

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170121
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AGL09810

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucag caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ugggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170122
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170123
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09812

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagga caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170124
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09813

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170125
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09814

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170126
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09815

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

agcaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170127
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170128
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cagcgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170129
<211> 1701
<212> RNA
<213> Artificial Sequence

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170130
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170131
<211> 1701
<212> RNA
<213> Artificial Sequence

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gaucgagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170132
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09821

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170133
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09822

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170134
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09823

<400> 170134
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170135
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09824

<400> 170135
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg caccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170136
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09825

<400> 170136
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170137
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09826

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg caccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170138
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09827

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170139
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09828

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuacaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170140
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGL09829

<400> 170140
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170141
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09830

<400> 170141
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170142
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09831

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170143
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09832

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcaccau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170144
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09833

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170145
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGL09881

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc gccagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170146
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09882

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170147
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09883

<400> 170147

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170148
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL09884

<400> 170148
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170149
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGL44438

<400> 170149
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggggc auccaccaca gcgugagcac cgccgagcag 600

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170150
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGN69267

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu guucaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaagga gaaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaagagagg cagcggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170151
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGN69278

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu guucaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg agcccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaagga gaaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acaagaaguu caagcccgag aucgccacca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaagagagg cagcggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggccugcugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170152
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGN69302

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ugcgugggcu accacgccaa caacagcacc gacaccgugg acaccauccu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugcagc 180

cugaacggca agauccccu gcagcugggc aacugcaacg uggccggcug gauccugggc 240

aaccccaagu gcgaccugcu gcugaccgcc aacagcugga gcuacaucau cgagaccagc 300

aacagcaagg acggcgccug cuaccccggc gaguucgccg acuacgagga gcugaaggag 360

cagcugagca ccgugagcag cuucgagaga uucgagaucu uccccaaggc caccagcugg 420

cccaaccacg acaccaccag aggcaccacc guggccugca gccacagcgg cgccaacagc 480

uucuacagaa accugcugug gaucgugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacacca acaacaaggg caaggaggug cuggugaucu ggggcgugca ccaccccccc 600

accgacagcg accagcagac ccuguaccag aacaaccaca ccuacgugag cgugggcagc 660

agcaaguacu acaagagauu cacccccgag aucguggcca gacccaaggu gagagagcag 720

gccggcagaa ugaacuacua cuggacccug cuggaccagg gcgacaccau caccuucgag 780

gccaccggca accugaucgc ccccuggcac gccuucgccc ugaagaaggg cagcagcagc 840

ggcaucauga ugagcgacgc ccaggugcac aacugcacca ccaagugcca gaccccccac 900

ggcgcccuga agggcaaccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac ccagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcuga uccugcugga gaacgagaga acccuggacu uccacgaccu gaacgugaag 1380

aaccuguacg agaaggugaa gagccagcug agaaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacaacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaugggcau ccaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagag ugugcaucug a 1701

<210> 170153
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGN69314

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugcagc 180

cugaacggca agauccccu gcagcugggc aacugcaacg uggccggcug gauccugggc 240

aaccccaagu gcgaccugcu gcugaccgcc aacagcugga gcuacaucau cgagaccagc 300

aacagcaagg acggcgccug cuaccccggc gaguucgccg acuacgagga gcugaaggag 360

cagcugagca ccgugagcag cuucgagaga uucgagaucu uccccaaggc caccagcugg 420

cccaaccacg acaccaccag aggcaccacc guggccugca gccacagcgg cgccaacagc 480

uucuacagaa accugcugug gaucgugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacacca acaacaaggg caaggaggug cuggugaucu ggggcgugca ccaccccccc 600

accgacagcg accagcagac ccuguaccag aacaaccaca ccuacgugag cgugggcagc 660

agcaaguacu acaagagauu cacccccgag aucguggcca gacccaaggu gagagagcag 720

gccggcagaa ugaacuacua cuggacccug cuggaccagg gcgacaccau caccuucgag 780

gccaccggca accugaucgc ccccuggcac gccuucgccc ugaagaaggg cagcagcagc 840

ggcaucauga ugagcgacgc ccaggugcac aacugcacca ccaagugcca gacccccccac 900

ggcgcccuga agggcaaccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac ccagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugaa gagccagcug agaaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacaacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaugggcau ccaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagag ugugcaucug a 1701

<210> 170154
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGN69326

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugcagc 180

cugaacggca agauccccu gcagcugggc aacugcaacg uggccggcug gauccugggc 240

aaccccaagu gcgaccugcu gcugaccgcc aacagcugga gcuacaucau cgagaccagc 300

aacagcaagg acggcgccug cuaccccggc gaguucgccg acuacgagga gcugaaggag 360

cagcugagca ccgugagcag cuucgagaga uucgagaucu uccccaaggc caccagcugg 420

cccaaccacg acaccaccag aggcaccacc guggccugca gccacagcgg cgccaacagc 480

uucuacagaa accugcugug gaucgugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacacca acaacaaggg caaggaggug cuggugaucu ggggcgugca ccacccccc 600

accgacagcg accagcagac ccuguaccag aacaaccaca ccuacgugag cgugggcagc 660

agcaaguacu acaagagauu cacccccgag aucguggcca gacccaaggu gagagagcag 720

gccggcagaa ugaacuacua cuggacccug cuggaccagg gcgacaccau caccuucgag 780

gccaccggca accugaucgc ccccuggcac gccuucgccc ugaagaaggg cagcagcagc 840

ggcaucauga ugagcgacgc ccaggugcac aacugcacca ccaagugcca gaccccccac 900

ggcgcccuga agggcaaccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac ccagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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auggagaacc ugaacaagaa gguggacgac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcuga uccugcugga gaacgagaga acccuggacu uccacgaccu gaacgugaag 1380

aaccuguacg agaaggugaa gagccagcug agaaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacaacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaugggcau ccaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagag ugugcaucug a 1701

<210> 170155
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGN69338

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugcagc 180

cugaacggca agauccccu gcagcugggc aacugcaacg uggccggcug gauccugggc 240

aaccccaagu gcgaccugcu gcugaccgcc aacagcugga gcuacaucau cgagaccagc 300

aacagcaaga acggcgccug cuaccccggc gaguucgccg acuacgagga gcugaaggag 360

cagcugagca ccgugagcag cuucgagaga uucgagaucu uccccaaggc caccagcugg 420

cccaaccacg acaccaccag aggcaccacc guggccugca gccacagcgg cgccaacagc 480

uucuacagaa accugcugug gaucgugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacacca acaacaaggg caaggaggug cuggugaucu ggggcgugca ccacccccc 600

accgacagcg accagcagac ccuguaccag aacaaccaca ccuacgugag cgugggcagc 660

agcaaguacu acaagagauu cacccccgag aucguggcca gacccaaggu gagagagcag 720

gccggcagaa ugaacuacua cuggacccug cugcaccagg gcgacaccau caccuucgag 780

gccaccggca accugaucgc ccccuggcac gccuucgccc ugaacgaggg cagcagcagc 840

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ggcgcccuga agggcaaccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac ccagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcuga uccugcugga gaacgagaga acccuggacu uccacgaccu gaacgugaag 1380

aaccuguacg agaaggugaa gagccagcug agaaacaacg ccaaggagau cggcaacggc 1440

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uacaacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaugggcau ccaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagag ugugcaucug a 1701

<210> 170156
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO00265

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gcugagcgag agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugaccag cuucgagaga uucgagaucu uccccaagga gaccagcugg 420

cccaagcaca acaccaccaa gggcgugacc gccgccugca gccacgccgg caagugcagc 480

uucuacagaa accugcugug gcugaccgag aaggacggca gcuaccccaa ccugaacaac 540

agcuacguga acaagaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucaagg accagcagac ccuguaccag aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcaugcac gagugcaaca ccaagugcca gaccccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

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ugcuucgagu ucuaccacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170157
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO00277

<400> 170157
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gcugagcaag agaagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc gacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaaccaca acaucaacau cggcgugacc gccgccugca gccacgccgg caagagcagc 480

uucuacaaga accugcugug gcugaccgag aaggacggca gcuaccccaa ccugaacaag 540

agcuacguga acaagaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucgaga accagaagac ccuguacaga aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg ccugggcagc 840

ggcaucauca ccagcaacgc cagcauggac gagugcgaca ccaagugcca gaccccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccuucaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cugggccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucaac ggcaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaacaagcu ggagaagaga 1260

auggagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugaa gaaccagcug agaaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170158
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGO00289

<400> 170158
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gcugagcaac agaagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaagcaca acaucaccag aggcgugacc guggccugca gccacgccaa gaagagcagc 480

uucuacaaga accugcugug gcugaccgag gccaacggcc uguaccccag ccugagcaag 540

agcuacguga acgacagaga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucgagg accagagaac ccuguacaga aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagaggccag 720

cccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaagau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg ccccggcagc 840

ggcaucauca ccagcaacgc cagcauggac gagugcgaca ccaagugcca gacccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaacaagcu ggagaagaga 1260

auggagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagccaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170159
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO00301

<400> 170159
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca aggccccccu gcagcugggc aacugcaaca ucgccggcug ggugcugggc 240

aaccccgagu gcgagagccu gcugagcaac agaagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc gacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaaccaca ccaccagagg cgugaccgcc gccugccccc acgccagaaa gagcagcuuc 480

uacaagaacc ugguguggcu gaccgaggcc aacggcagcu accccaaccu gagcagaagc 540

uacgugaaca accaggagaa ggaggugcug gugcuguggg gcgugcacca ccccagcaac 600

aucgaggagc agagagcccu guacagaaag gacaacgccu acgugagcgu ggugagcagc 660

aacuacaaca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccagagc 720

ggcagaauga acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aucaucacca gcaacgcccc ccuggacgag ugcgacacca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac auccaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcaccaa gcugagaaug gugaccggcc ugagaaacau ccccagcgug 1020

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucauggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagaa ccagcugaga aacaacgcca aggagcuggg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170160
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO00313

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagggc 420

uucaacugga ccggcgugac ccagaacggc ggcagcuacg ccugcaagag aggccccgac 480

aacagcuucu ucagcagacu gaacuggcug uacaagagcg agagcaccua ccccgugcug 540

aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acaaggagca gaccaaccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccaucauc cccaacgugg gcagcagacc cugggugaga 720

ggccugagca gcggcaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170161
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO00325

<400> 170161
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ggcaacgaca acaacagcac cgccacccug ugccugggcc accacgccgu gcccaacggc 120

acccugguga agaccaucac caacgaccag aucgagguga ccaacgccac cgagcuggug 180

cagagcagca gcaccggcaa gaucugcaac aacccccaca gaauccugga cggcaucaac 240

ugcacccuga ucgacgcccu gcugggcgac ccccacugcg acggcuucca gaacgagaag 300

ugggaccugu ucguggagag aagcaaggcc uucagcaacu gcuaccccua cgacgugccc 360

gacuacgcca gccugagaag ccugguggcc agcagcggca cccuggaguu caucaacgag 420

ggcuucaacu ggaccggcgu gacccagaac ggcggcagca acgccugcaa gagaggcccc 480

gacagcggcu ucuucagcag acugaacugg cuguacaaga gcggcagcac cuaccccgug 540

cagaacguga ccaugcccaa caacgacaac agcgacaagc uguacaucug gggcgugcac 600

caccccagca ccgacaagga gcagaccaac cuguacgugc aggccagcgg caaggugacc 660

gugagcacca agagaagcca gcagaccauc aucccccaacg ugggcagcag acccugggug 720

agaggccuga gcagcagaau cagcaucuac uggaccaucg ugaagcccgg cgacauccug 780

gugaucaaca gcaacggcaa ccugaucgcc cccagaggcu acuucaagau gagaaccggc 840

aagagcagca ucaugagaag cgacgccccc aucggcaccu gcagcagcga gugcaucacc 900

cccaacggca gcaucccccaa cgacaagccc uuccagaacg ugaacaagau caccuacggc 960

gccugcccca aguacgugaa gcagaacacc cugaagcugg ccaccggcau gagaaacgug 1020

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gagggcauga ucgacggcug guacggcuuc agacaccaga acagcgaggg caccggccag 1140

gccgccgacc ugaagagcac ccaggccgcc aucgaccaga ucaacggcaa gcugaacaga 1200

gugaucgaga agaccaacga gaaguuccac cagaucgaga aggaguucag cgagguggag 1260

ggcagaaucc aggaccugga gaaguacgug gaggacacca agaucgaccu guggagcuac 1320

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ggcaccuacg accacgacgu guacagagac gaggcccuga acaacagauu ccagaucaag 1560

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ugcuuccugc ugugcguggu gcugcugggc uucaucaugu gggccugcca gaagggcaac 1680

aucagaugca acaucugcau cuga 1704

<210> 170162
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO00337

<400> 170162
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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uacagaaacc ugcuguggcu gaccgagaag gagggcagcu accccaagcu gaagaacagc 540

uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca ccccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170163
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO00349

<400> 170163
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

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aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170164
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO00373

<400> 170164
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccgaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gagcagcuuc 480

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uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

gccaucaaca gcagccugcc cuaccagaac auccaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

aucgacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa caugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

cuggagagca ugggcaucua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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hemagglutinin__InfluenzaA__AGO00385

<400> 170165

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug ggcagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccgaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag gagagcagcu accccaagcu gaagaacagc 540

uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca ccccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 170166
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug ggcagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugaa ggaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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<210> 170167
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGO00409

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug ggcagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccgaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gaacagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag aagagcagcu accccgagcu gaagaacagc 540

uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugaa ggaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 170168
<211> 1698
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGO00421

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaag 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccggcu gcgacccccu gcugcccgug ggcagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucaagaucu uccccaagga gagcagcugg 420

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uacgugaaca agaagagaaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugaa gggccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170169
<211> 1698

<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGO00433

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170170
<211> 1698
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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<210> 170171
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO02696

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 170172
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO02697

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170173
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGO02698

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170174
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO02699

<400> 170174
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170175
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO02700

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccagauacag cgaggaggcc aagcugaaca gagaggagau cgacggcauc 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170176
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 170176
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcca cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacggcc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170177
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO51374

<400> 170177
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170178
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGO86686

<400> 170178
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcugg agaacagaua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

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ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaccuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170179
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ16240

<400> 170179
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170180
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ16241

<400> 170180
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170181
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGQ16242

<400> 170181
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcacc 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170182
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ16243

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170183
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ16245

<400> 170183

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170184
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ16247

<400> 170184
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170185
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ16248

<400> 170185
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170186
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ16329

<400> 170186
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170187
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ16331

<400> 170187
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170188
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ16332

<400> 170188
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170189
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170190
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ16335

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccagg ugcuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170191
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ16336

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agaagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170192
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ16337

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccagg ugcuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170193
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ16338

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170194
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGQ16339

<400> 170194
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caagaacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170195
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ16340

<400> 170195
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170196
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ16341

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170197
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170198
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ16343

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170199
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ16344

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170200
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ16345

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170201
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ16346

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170202
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ16347

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170203
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ16348

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170204
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__AGQ16349

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170205
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGQ16350

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugga ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170206
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ47719

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugggcggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu guucaccgug agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacguga acaacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccccc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acagaaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaacagagg cagcggcagc 840

ggcaucauca ucagcgacgc ccccauccac gacugcaaca ccaagugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacggcc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcgugauc 1200

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug agaaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170207
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ47728

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgugaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170208
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ47740

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaag 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacagccu gcugcccgcc agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcgccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag ccuggagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca acaccaucaa gggcgugacc gccagcugca gccacagagg ccagagcagc 480

uucuacagaa accugcugug gcugaccaag aagggcgaca gcuaccccaa gcugaacaac 540

agcuacguga acaacaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

agcagcaacg agcagcagag ccuguacaga aacgagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgcca gacccaaggu gagagaccag 720

accggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau cauguucgag 780

gccaccggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcaugcac gagugcaaca ccaagugcca gaccccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgaccu gaacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac gagugcaugg agagcgugag aaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170209
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ47752

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca aggccccccu gcagcugggc aagugcaaca ucgccggcug ggugcugggc 240

aaccccgagu gcgagagccu gcugagcaac agaagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaagcaca acaccaucag aggcgugacc gccgccugca gccacgccgg caagagcagc 480

uucuacaaga accuggugug gcugaccgag gccaacggca gcuaccccgc ccugagcacc 540

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aacaucgagg agcagagaac ccuguacaga aaggacaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccaaga gacccaaggu gagagaccag 720

cccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaccggca accugaucgc ccccugguac gccuucgccc ugagcagagg ccccggcagc 840

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ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guacagaauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 170210
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ47764

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gcugagcaag agaagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcgccug cuaccccggc gacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaagcaca acaucaccag aggcgugacc gccgccugca gccacgccgg caagagcagc 480

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aacaucgagg accagaagac ccuguacaga aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagaggccag 720

gccggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagaga cuucggcagc 840

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ugcuucgagu ucuaccacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170211
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ47776

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gcugagcaag agaagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc gacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaagcaca acaucaacau cggcgugacc gccgccugca gccacgccgg caagagcagc 480

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agcuacguga acaagaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucgagg accagaagac ccuguacaga aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg ccugggcagc 840

ggcaucauca ccagcaacgc cagcauggac gagugcgaca ccaagugcca gaccccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccuucaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccagaaga gcacccagaa cgccaucaac ggcaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaacaagcu ggagaagaga 1260

auggagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170212
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<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag aagagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaagcaca acgugaccag aggcgugacc gccgccugca gccacaaggg caagagcagc 480

uucuacagaa accugcugug gcugaccgag aaggacggca gcuaccccaa ccugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucgagg accagaagac ccuguacaga aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagaggccag 720

gccggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccuggcac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcauggac gagugcgaca ccaagugcca gacccccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170213
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ47800

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccauccu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gcugagcgag agaagcugga gcuacaucgu ggagaucccc 300

aacagcgaga acggcaccug cuaccccggc gacuucaccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaagcaca acaccgccag aggcgugacc gccgccugca gccacgccgg caagagcagc 480

uucuacagaa accugcugug gcugaccgag aaggacggca gcuaccccaa ccugaagaac 540

agcuacguga acaagaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

agcaucaagg agcagcagac ccuguaccag aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcaugcac gagugcgaca ccaagugcca gacccccccag 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaacaaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170214
<211> 1701
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hemagglutinin__InfluenzaA__AGQ47811

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag aagagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc uucuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagaagcugg 420

cccaagcaca acgugaccag aggcgugacc gccgccugca gccacaaggg caagagcagc 480

uucuacagaa accugcugug gcugaccgag aagaacggca gcuaccccaa ccugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucgagg accagaagac caucuacaga aaggagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagaggccag 720

gccggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccuggcac gccuucgccc ugagcagagg cuucggcagc 840

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ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170215
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AGQ47823

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccaagu gcgagagccu guucagcaag gagagcugga gcuacaucgc cgagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccaa gggcgugacc accagcugca gccacaacgg caagagcagc 480

uucuacagaa accugcugug gcugaccgag aagaacggcc uguaccccaa ccugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucagag accagagagc caucuaccac accgagaacg ccuacgugag cguggugagc 660

agccacuaca gcagaagauu cacccccgag aucgccaaga gacccaaggu gagaggccag 720

gagggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

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ggcgccauca acagcagccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gaggcaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170216
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ47835

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gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacua cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagggc 420

uucaacugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccaac 480

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170217
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ47847

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cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacagccu gcugcccgcc agcagcugga gcuacaucgu ggagaccccc 300

aacagcaaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaagcaca acaccaccaa gggcgugacc gccgccugca gccacgccgg caagagcagc 480

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agcuacguga acaagaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacagcaagg agcagcagac ccuguaccag aacgagaacg ccuacgugag cguggugagc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 170218
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ47870

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gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugggcggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu gcugaccgug agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

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accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acagaaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 170219
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ47882

<400> 170219

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gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugggcggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu gcugaccgug agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacguga acaacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acagaaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaacagagg cagcggcagc 840

ggcaucauca ucagcgacgc ccccgugcac gacugcaaca ccaagugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccagagaa gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug agaaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170220
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaccugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagggc 420

uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccgac 480

agcggcuucu ucagcagacu gaacuggcug uacaagagcg gcagcgccua ccccgugcug 540

aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg accaggagca gaccaaccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170221
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cuggugaaga ccaucaccga cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg uguuccagaa cgagaccugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caccgagggc 420

uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccggc 480

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aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cauccaccac 600

cccagcacca accaggagca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccagaa gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170222
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ggcaacgaca acaacaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccga cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg uguuccagaa cgagaccugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caccgagggc 420

uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccggc 480

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aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccagaa gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170223
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AGQ47930

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgcccu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca acaccaacaa gggcgugacc gccgccugca gccacgccgg caagagcagc 480

uucuacagaa accugcugug gcugaccgag aaggagggca gcuaccccaa gcugaagaac 540

agcuacguga acaagaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

aacagcaagg accagcagaa ccuguaccag aacgagaacg ccuacgugag cguggugacc 660

agcaacuaca acagaagauu cacccccgag aucgccgaga gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug cugaagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccauguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcaugcac gagugcaaca ccaagugcca gaccccccug 900

ggcgccauca acagcagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcgc caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac gagugcaugg agagcgugag aaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaaggu ggacggcgug 1560

aagcuggaga gcaugggcau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170224
<211> 1698
<212> RNA
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hemagglutinin__InfluenzaA__AGQ47942

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca ccccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170225
<211> 1698
<212> RNA
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hemagglutinin__InfluenzaA__AGQ47954

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guacagaaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170226
<211> 1698
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGQ47966

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug ggcagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

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aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugaa ggaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170227
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ47978

<400> 170227
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug ggcagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccgaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gaacagcuuc 480

uacagaaacc ugcuguggcu gaccaagaag gagagcagcu accccgagcu gaagaacagc 540

uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugaa ggaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

gccaucaaca gcagccugcc cuaccagaac auccaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

aucgacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

cuggagagca ugggcaucua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170228
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ47990

<400> 170228
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug ggcagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucaagaucu uccccaagga gagcagcugg 420

cccgaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gaacagcuuc 480

uacagaaacc ugcuguggcu gaccaagaag gagagcagcu accccgagcu gaagaacagc 540

uacgugaaca agaagggcaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugaa ggaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

gccaucaaca gcagccugcc cuaccagaac auccaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

aucgacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

cuggagagca ugggcaucua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170229
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ48002

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug ggcagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucaagaucu uccccaagga gagcagcugg 420

cccgaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gaacagcuuc 480

uacagaaacc ugcuguggcu gaccaagaag gagagcagcu accccgagcu gaagaacagc 540

uacgugaaca agaagagaaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugaa ggaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

gccaucaaca gcagccugcc cuaccagaac auccaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

aucgacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

cuggagagca ugggcaucua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170230
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGQ48014

<400> 170230
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccggcu gcgacccccu gcugcccgug ggcagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucaagaucu uccccaagga gagcagcugg 420

cccgaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gaacagcuuc 480

uacagaaacc ugcuguggcu gaccaagaag gagagcagcu accccgagcu gaagaacagc 540

uacgugaaca agaagagaaa ggaggugcug gugcuguggg gcauccacca ccccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugaa ggaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

gccaucaaca gcagccugcc cuaccagaac auccaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

aucgacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

cuggagagca ugggcaucua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170231
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ48026

<400> 170231
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaag 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccggcu gcgacccccu gcugcccgug ggcagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucaagaucu uccccaagga gagcagcugg 420

cccgaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gaacagcuuc 480

uacagaaacc ugcuguggcu gaccaagaag gagagcagcu accccgagcu gaagaacagc 540

uacgugaaca agaagagaaa ggaggugcug gugcuguggg gcauccacca cccccccaac 600

agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugaa ggaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

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aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170232
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ48038

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaag 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccggcu gcgacccccu gcugcccgug ggcagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucaagaucu uccccaagga gagcagcugg 420

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aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugaa gggccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170233
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ48050

<400> 170233
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaag 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccggcu gcgacccccu gcugcccgug ggcagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucaagaucu uccccaagga gagcagcugg 420

cccgaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gaacagcuuc 480

uacagaaacc ugcuguggcu gaccaagaag gagagcagcu accccgagcu gaagaacagc 540

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aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugaa gggccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucaaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 170234
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80946

<400> 170234
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ggcuaccaca gcaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg cccaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcauccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugac cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agaaacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga cccacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggccccaac uaccccgugg ccaagggcag cuacaacaac 540

accagcggcg accagaugcu gaucaucugg ggcgugcacc accccaacga cgaggccgag 600

cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagcg ugcccgagau cgccaccaga cccaagguga acggccaggg cggcagaaug 720

gaguucagcu ggaccauccu ggacgugcug gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cauccacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga gacuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccaucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agaagagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgcc aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcaac 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaucg ccggcaucag ccuguggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 170235
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
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ggcuaccaca gcaacaacag caccgagaag guggacacca uccuggagag aaacaucacc 120

gugacccacg cccaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcaacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugac cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga cccacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggcagcaac uaccccaucg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgacgccgag 600

cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca uccccgagau cgccaccaga cccaagguga acggccaggg cggcagaaug 720

gaguucagcu ggaccauccu ggacaugcug gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cauccacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga gacuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccaucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc aacaaccugg agaagagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugaa ggacaacgcc aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcaac 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaucg ccggcgugag ccuguggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 170236
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80948

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ggcuaccaca gcaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg cccaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcaacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugac cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agaaacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga cccacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc guguucggca accccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggcagcaac uaccccaucg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgacgccgag 600

cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca uccccgagau cgccaccaga cccaagguga acggccaggg cggcagaaug 720

gaguucagcu ggaccauccu ggacaugcug gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cauccacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga gacuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccaucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc aacaaccugg agaagagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aagaucagaa ugcagcugaa ggacaacgcc aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcaac 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaucg ccggcaucag ccuguggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 170237
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ80949

<400> 170237

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ggcuaccaca gcaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg cccaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugac cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agaaacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga cccacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggcagcaac uaccccaucg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgacgccgag 600

cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca uccccgagau cgccaccaga cccaagguga acggccaggg cggcagaaug 720

gaguucagcu ggaccauccu ggacaugcug gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cauccacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga gacuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccaucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc aacaaccugg agaagagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aagaucagaa ugcagcugaa ggacaacgcc aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcaac 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaucg ccggcaucag ccuguggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 170238
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80950

<400> 170238
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ggcaacgaca gcagcaccgc cacccugugc cugggccacc acgccgugcu gaacggcacc 120

aucgugaaga ccaucaccga cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacaaga uccuggacgg cagagacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg uguuccagga cgagaccugg 300

gaccuguucg uggagagaag cagcgccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caccgagggc 420

uucaccugga ccggcgugag ccagaacggc ggcagcggcg ccugcaagag aggccccgcc 480

aacggcuucu ucagcagacu gaacuggcug accaagagcg gcaacgccua ccccgugcug 540

aacgugacca ugcccaacag cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccagaa gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccagagcg gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gagaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagagug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacaucua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagag aggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170239
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80951

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ggcaaccccg ugaucugcau gggccaccac gccguggcca acggcaccau ggugaagacc 120

cugaccgacg accaggugga gguggugacc gcccaggagc ugguggagag ccagaaccug 180

cccgagcugu gccccagccc ccugagacug guggacggcc agaccugcga caucaucaac 240

ggcgcccugg gcagccccgg cugcgaccac cugaacggcg ccgaguggga caucuucauc 300

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agaagcaucc uggccaacaa cggcaaguuc gaguucaucg ccgaggaguu ccaguggagc 420

accgugaagc agaacggcaa gagcggcgcc ugcaagagag ccaacgugaa cgacuucuuc 480

aacagacuga acuggcuggu gaagagcgac ggcaacgccu acccccugca gaaccugacc 540

aaggugaaca acggcgacua cgccagacug uacaucuggg gcgugcacca ccccagcacc 600

gacaccgagc agaccaaccu guacaagaac aaccccggca gagugaccgu gagcaccaag 660

accagccaga ccagcguggu gcccaacauc ggcagcagac ccugggugag aggccagagc 720

ggcagaauca gcuucuacug gaccaucgug gagcccggcg accugaucgu guucaacacc 780

aucggcaacc ugaucgcccc cagaggccac uacaagcuga acagccagaa gaagagcacc 840

auccugaaca ccgccacccc caucggcagc ugcgugagca agugccacac cgacaagggc 900

agccugagca ccaccaagcc cuuccagaac aucagcagag uggccaucgg cgacugcccc 960

aaguacguga agcagggcag ccugaagcug gccaccggca ugagaaacau ccccgagaag 1020

gccagcagag gccuguucgg cgccaucgcc ggcuucaucg agaacggcug gcagggccug 1080

aucgacggcu gguacggcuu cagacaccag aacgccgagg gcaccggcac cgccgccgac 1140

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aagaccaacg agaaguacca ccagaucgag aaggaguucg agcaggugga gggcagaauc 1260

caggaccugg agaaguacgu ggaggacacc aagaucgacc uguggagcua caacgccgag 1320

cugcuggugg cccuggagaa ccagcacacc aucgacguga ccgacagcga gaugaacaag 1380

cuguucgaga gagugagaag acagcugaga gagaacgccg aggacaaggg caacggcugc 1440

uucgagaucu uccacaagug cgacaacaac ugcaucgaga gcaucagaaa cggcaccuac 1500

gaccacgacg uguacagaaa cgaggccauc aacaacagau uccagaucca gggcgugaag 1560

cugacccagg gcuacaagga caucauccug uggaucagcu ucagcaucag cugcuuccug 1620

cugguggccc ugcugcuggc cuucauccug ugggccugcc agaacggcaa caucagaugc 1680

cagaucugca ucuga 1695

<210> 170240
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ80953

<400> 170240
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

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cccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

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gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170241
<211> 1683

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80954

<400> 170241
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170242
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80955

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

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cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga gacagaucgg caacgugauc 1260

aacuggacca gagacagcau gaccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170243
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ80956

<400> 170243
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga gacagaucgg caacgugauc 1260

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170244
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80957

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga gacagaucgg caacgugauc 1260

aacuggacca gagacagcau gaccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170245
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ80958

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau gaccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170246
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ80959

<400> 170246
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacggcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agagccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170247
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80961

<400> 170247
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacgugcc caagaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg agacccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacgcc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccug cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccagcugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccuga ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau gaccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc aagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170248
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGQ80962

<400> 170248
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacgugcc caagaucugc 180

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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg agacccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacgcc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccug cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccuga ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau gaccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

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uacagagagg aggccaugca gaacagaauc aagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170249
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80964

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccgacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

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cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170250
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80965

<400> 170250
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga gacagaucgg caacgugauc 1260

aacuggacca gagacagcau gaccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170251
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ80966

<400> 170251
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170252
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau gaccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170253
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ80970

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agaaggccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170254
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ80971

<400> 170254
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agaagaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170255
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80974

<400> 170255

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170256
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80977

<400> 170256
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc gugcaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag agcggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170257
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80978

<400> 170257
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcau caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170258
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80979

<400> 170258
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

cccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ucggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga gacagaucgg caacgugauc 1260

aacuggacca gagacagcau gaccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170259
<211> 1683

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80980

<400> 170259
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccuggu ggacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga gacagaucgg caacgugauc 1260

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170260
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80981

<400> 170260
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga gacagaucgg caacgugauc 1260

aacuggacca gagacagcau gaccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170261
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80982

<400> 170261
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau gaccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170262
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80983

<400> 170262
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

cccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170263
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80984

<400> 170263
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170264
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80985

<400> 170264
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170265
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80986

<400> 170265
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga gacagaucgg caacgugauc 1260

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gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170266
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGQ80987

<400> 170266
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga gacagaucgg caacgugauc 1260

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170267
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ80988

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170268
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80990

<400> 170268
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agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga gacagaucgg caacgugauc 1260

aacuggacca gagacagcau gaccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170269
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ80991

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agaagaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170270
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80992

<400> 170270
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacgugcc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc augaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccug cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccagcugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccuga ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170271
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80993

<400> 170271
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170272
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80994

<400> 170272
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg agacccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacgcc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccug cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccuga ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau gaccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc aagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170273
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80995

<400> 170273

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccgacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

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cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170274
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80996

<400> 170274
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170275
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ80997

<400> 170275
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agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

gacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cagccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170276
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81000

<400> 170276
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agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

cccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucgg caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagaag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170277
<211> 1683

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81001

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agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcaccagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170278
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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<400> 170278
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccuggu ggacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170279
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81003

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170280
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81004

<400> 170280
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

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ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170281
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81005

<400> 170281
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

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cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170282
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81006

<400> 170282
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170283
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81007

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agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccuggu ggacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170284
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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<400> 170284
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agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170285
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81009

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagagccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagacaggag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucaa caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac caccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacaacg gcggcaccau caucagcaac 900

cugcccuucc agaacaucaa cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170286
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81011

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc gagagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc aaggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gccugauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170287
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81012

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucaa caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170288
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81017

<400> 170288
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

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cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170289
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81018

<400> 170289
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucgu gaaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgccaucau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170290
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81019

<400> 170290
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agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucgu gaaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgccaucau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170291
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<212> RNA
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hemagglutinin__InfluenzaA__AGQ81020

<400> 170291

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170292
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucgu gaaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgccaucau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagca gaggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170293
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170294
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

cccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucgu gaaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgccaucau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170295
<211> 1683

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81025

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguggugau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170296
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

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agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccacca ccaagagcua caagaacacc 540

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170297
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81027

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

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cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170298
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81028

<400> 170298
augaacaccc agauccuggu guucgcccug aucgccauca uccccaccaa cgccgacaag 60

aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccacca ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgagaug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170299
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81029

<400> 170299
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucaugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170300
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81031

<400> 170300
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucaa caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagaug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga gacagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170301
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81032

<400> 170301
augaacaccc agauccuggu guucgcccug aucgccauca uccccaccaa cgccgacaag 60

aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccacca ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170302
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGQ81033

<400> 170302
augaacaccc agauccuggu guucgcccug aucgccauca uccccaccaa cgccgacaag 60

aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170303
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81034

<400> 170303
augaacaccc agauccuggu guucgcccug aucgccauca uccccaccaa cgccgacaag 60

aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccacca ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170304
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81035

<400> 170304
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170305
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81036

<400> 170305
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170306
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81037

<400> 170306
augaacaccc agauccuggu guucgcccug aucgccauca uccccaccaa cgccgacaag 60

aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170307
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81038

<400> 170307
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucgu gaaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgccaucau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagca gaggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170308
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81039

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucgu gaaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgccaucau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagca gaggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170309
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81040

<400> 170309

augaacaccc agauccuggu guucgcccug aucgccauca uccccaccaa cgccgacaag 60

aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagaucgacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170310
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81041

<400> 170310
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagacca ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170311
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81042

<400> 170311
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170312
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81043

<400> 170312
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

cccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggag augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170313
<211> 1683

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81044

<400> 170313
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170314
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGQ81045

<400> 170314
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170315
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81046

<400> 170315
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170316
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81047

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170317
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81049

<400> 170317
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccacca ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170318
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81050

<400> 170318
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170319
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81051

<400> 170319
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucaa caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170320
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGQ81052

<400> 170320
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170321
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81053

<400> 170321
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucaa caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagaug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagaaagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170322
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81055

<400> 170322
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170323
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81056

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170324
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81057

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170325
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81058

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170326
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81059

<400> 170326
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170327
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81060

<400> 170327

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170328
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81061

<400> 170328
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

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uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170329
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81081

<400> 170329
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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccaacc ugggcagacc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgacau ccugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc gugcaggacg cccaguacac caacaacaga 540

ggcagaaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugagacc cggccagacc cugagaauca gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaacagcg gcaacugcgu ggugcagugc cagaccgaga gaggcggccu gaacaccacc 900

cugcccuucc acaacgugag caaguacgcc uucggcaacu gccccaagua cgugggcgug 960

aagagccuga agcuggccgu gggccugaga aacgugcccg ccagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcacc ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag aucgagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

aagagagccc ugggcagcaa cgccguggag gacggcaagg gcugcuucga gcuguaccac 1440

aagugcgaca accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

aaggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170330
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGQ81086

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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccaacc ugggcagacc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc gugcaggacg cccaguacac caacaacaga 540

ggcagaaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugagacc cggccagacc cugagaauca gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaacagcg gcaacugcgu ggugcagugc cagaccgaga gaggcggccu gaacaccacc 900

cugcccuucc acaacgugag caaguacgcc uucggcaacu gccccaagua cgugggcgug 960

aagagccuga agcuggccgu gggccugaga aacgugcccg ccagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcacc ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag aucgagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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aagugcgaca accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

aaggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170331
<211> 1683

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81087

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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

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gccaccaacc ugggccaccc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc auccaggacg cccaguacac caacaacaga 540

gagaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagagugcu gaagaccgac 840

cugaagagag gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua cgugggcgug 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaugac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucaaccacga guucagcgag aucgagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaagauac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170332
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81092

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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccaacc ugggcagacc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acaccggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc gugcaggacg cccaguacac caacaacaga 540

ggcagaaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugagacc cggccagacc cugagaauca gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagagcg gcaacugcgu ggugcagugc cagaccgaga gaggcggccu gaacaccacc 900

cugcccuucc acaacgugag caaguacgcc uucggcaacu gccccaagua cgugggcgug 960

aagagccuga agcuggccgu gggccugaga aacgugcccg ccagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcacc ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag aucgagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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aagugcgaca accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

aaggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170333
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81095

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aucugcaucg gcuaccagag caccaacagc accgagaccg ugaacacccu gaccgaggac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccaacc ugggcagacc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc gugcaggacg cccaguacac caacaacaga 540

ggcagaaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaauca gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc acaacgugag caaguacgcc uucggcaacu gccccaagua cgugggcgug 960

aagagccuga agcuggccgu gggccugaga aacgugcccg ccagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcacc ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag aucgagacca gacugaacau gaucaacaac 1260

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gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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aaggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaagaaa caucugcauc 1680

uga 1683

<210> 170334
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81099

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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccaa cagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc acccaggacg cccaguacac caacaacaga 540

gagaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua cgugggcgug 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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aagagagccc ugggcagcaa cgccguggag gacggcaagg gcugcuucga gcuguaccac 1440

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caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaagaaa caucugcauc 1680

uga 1683

<210> 170335
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81100

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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

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agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc auccaggacg cccaguacac caacaacaga 540

gagaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua cgugggcgug 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaagaaa caucugcauc 1680

uga 1683

<210> 170336
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81123

<400> 170336
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aucugcaucg gcuaccagag caccaacagc accgagaccg ugaacacccu gaccgaggac 120

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agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc gugcaggacg cccaguacac caacaacaag 540

ggcagaaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaauca gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc acaacgugag caaguacgcc uucggcaacu gccccaagua cgugggcgug 960

aagagccuga agcuggccgu gggccugaga aacgugcccg ccagaagcac cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcacc ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag aucgagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170337
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81124

<400> 170337
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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

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cccagcgccg ugaacggcgu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga cagcaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aaacaugaga 480

uggcugaccc agaaggacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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aagugcgaca accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

cagaaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

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<212> RNA
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agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga cagcaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaaggacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gugagccacg gcagaauccu gaagaccgac 840

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aagugcgaca accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

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<212> RNA
<213> Artificial Sequence

<220>
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ggcaacccca gcugcgaccu gcugcuggag ggcagagagu ggagcuacau cguggagaga 300

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acccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugaccu acaccggcac cagcagaagc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagagcgg cuucuacccc gugcaggacg ccaaguacac caacaacaga 540

ggcaagaaca uccuguucgu gugggcauc caccaccccc acaccuacac cgaccagacc 600

acccuguaca ucagaaacga caccaccacc agcgugacca ccgaggagcu gaacagaauc 660

uucaagcccg ugaucgugcc cagacugcug gugaacggcc agcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacgu gcugagcggc ggcagccacg gcagaauccu gaagaccgac 840

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cugcccuucc acaacaucag caaguacgcc uucggcaccu gccccaagua cgugaaggug 960

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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agagaggaga gcagacugga gcagcagaga aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugcu ggccaugggc 1620

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uga 1683

<210> 170340
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<212> RNA
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gccaccaacc ugggcagacc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

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cccagcgccg ugaacggcgu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga cagcaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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aagugcgaca accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

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uga 1683

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<212> RNA
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cccagcgccg ugaacggcgu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga cagcaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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caggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccugguggu ggccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170342
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81130

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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc auccaggacg cccaguacac caacaaccag 540

gagaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgugcagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca gaagcaacgg caaccugauc 780

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uga 1683

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<212> RNA
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hemagglutinin__InfluenzaA__AGQ81132

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uggcugaccc agaagagcgg cuucuacccc gugcaggacg ccaaguacac caacaacaga 540

ggcaagaaca uccuguucgu gugggcauc caccaccccc acaccuacac cgaccagacc 600

acccuguaca ucagaaacga caccaccacc agcgugacca ccgaggagcu gaacagaauc 660

uucaagcccg ugaucgugcc cagacugcug gugaacggcc agcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacgu gcugagcggc ggcagccacg gcagaauccu gaagaccgac 840

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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uga 1683

<210> 170344
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81133

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uucaagcccg ugaucgugcc cagacugcug gugaacggcc agcagggcag aaucgacuac 720

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accuacaaga uccugaccau cuacagcacc guggccagca gccuggugcu ggccaugggc 1620

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uga 1683

<210> 170345
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81134

<400> 170345

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acccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugaccu acaccggcac cagcagaagc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagagcgg cuucuacccc gugcaggacg ccaaguacac caacaacaga 540

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uucaagcccg ugaucgugcc cagacugcug gugaacggcc agcagggcag aaucgacuac 720

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aagagagccc ugggcagcaa cgccauggag gacggcaagg gcugcuucga gcuguaccac 1440

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agagaggaga gcagacugga gcagcagaga aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugcu ggccaugggc 1620

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uga 1683

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aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacaa cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

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uga 1683

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aacgugaccu acaccggcac cagcagaagc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagagcgg cuucuacccc gugcaggacg ccaaguacac caacaacaga 540

ggcaagaaca uccuguucgu gugggcauc caccaccccc acaccuacac cgaccagacc 600

acccuguaca ucagaaacga caccaccacc agcgugacca ccgaggagcu gaacagaauc 660

uucaagcccg ugaucgugcc cagacugcug gugaacggcc agcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

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uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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accuacaaga uccugaccau cuacagcacc guggccagca gccuggugcu ggccaugggc 1620

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uga 1683

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acccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugaccu acaccggcac cagcagaagc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagagcgg cuucuacccc gugcaggacg ccaaguacac caacaacaga 540

ggcaagaaca uccuguucgu gugggcauc caccaccccc acaccuacac cgaccagacc 600

acccuguaca ucagaaacga caccaccacc agcgugacca ccgaggagcu gaacagaauc 660

uucaagcccg ugaucgugcc cagacugcug gugaacggcc agcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

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uga 1683

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aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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uga 1683

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uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

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uga 1683

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uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

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uga 1683

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uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

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uga 1683

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agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga cagcaucugg 420

aacgugagcu acggcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc acaacgugag caaguacgcc uucggcaacu gccccaagua caucggcgug 960

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ggcuuccagc acagcaacga ccagggcacc ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag aucgagacca gacugaacau gaucaacgac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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aagugcgaca accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 170354
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGQ81146

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cccagcgccg ugaacggcau gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga cagcaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaagacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc acaacgugag caaguacgcc uucggcaacu gccccaagua caucggcgug 960

aagagccuga agcuggccgu gggccugaga aacgugcccg ccagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcacc ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag aucgagacca gacugaacau gaucaacgac 1260

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gagaaccaga agacccugga cgagcacgac agcaacguga acaaccugua caacaaggug 1380

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aagugcgaca accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

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<212> RNA
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cccagcgccg ugaacggcau gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga cagcaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgugcagacc 600

aaccuguaca ccagaaccga caccaagacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc acaacgugag caaguacgcc uucggcaacu gccccaagua caucggcgug 960

aagagccuga agcuggccgu gggccugaga aacgugcccg ccagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcacc ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag aucgagacca gacugaacau gaucaacgac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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aagugcgaca accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 170356
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<212> RNA
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gccaccaacc ugggcagacc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

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cccagcgccg ugaacggcau gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga cagcaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaagacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc acaacgugag caaguacgcc uucggcaacu gccccaagua caucggcgug 960

aagagccuga agcuggccgu gggccugaga aacgugcccg ccagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcacc ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag aucgagacca gacugaacau gaucaacgac 1260

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gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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caggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 170357
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81149

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ggcaacccca gcugcgaccu gccccuggag ggcagagagu ggagcuacau cguggagaga 300

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agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga cagcaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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ggcuuccagc acagcaacga ccagggcacc ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag aucgagacca gacugaacau gaucaacgac 1260

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accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 170358
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81150

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agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga cagcaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacgacaga 540

ggcaacaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgugcagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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ggcuuccagc acagcaacga ccagggcacc ggcauggccg ccgacagaga cagcacccag 1140

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caggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

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uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170359
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81152

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cccagcgccg ugaacggcgu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag aagauccaga ucuuccccga cagcaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgugcagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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uacgagauca ucgaccacga guucagcgag aucgagacca gacugaacau gaucaacgac 1260

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uga 1683

<210> 170360
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGQ81153

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agccuguuca gcagcgccag cagcuaccag aagauccaga ucuuccccga cagcaucugg 420

aacgugagcu acggcggcau cagcaaggcc ugcagcaaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccaacac cacccagacc 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau ccacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc aagagccacg gcagaauccu gaagaccgac 840

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uacgagauca ucgaccacga guucagcgag aucgagacca gacugaacau gaucaacgac 1260

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accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170361
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

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uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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caggaggaga gcagacugga gagacaggag aucgagggcg ugaagcugga gagcgagggc 1560

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uga 1683

<210> 170362
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<212> RNA
<213> Artificial Sequence

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cccagcgccg ugaacggcgu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag aagauccaga ucuuccccga cagcaucugg 420

aacgugagcu acggcggcau cagcaaggcc ugcagcaaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccaacac cacccagacc 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau ccacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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aagugcgaca accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

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accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

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<212> RNA
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gccaccaacc ugggcagacc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

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cccagcgccg ugaacggcgu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag aagauccaga ucuuccccga cagcaucugg 420

aacgugagcu acaacggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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uga 1683

<210> 170364
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<212> RNA
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cccagcgccg ugaacggcgu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga cagcaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa caacuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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caggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 170365
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81159

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ggcaacccca gcugcgaccu gccccuggag ggcagagacu ggagcuacau cguggagaga 300

cccagcgccg ugaacggcgu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag cagcuaccag aagauccaga ucuuccccga cagcaucugg 420

aacgugagcu acgacggcau cagcaaggcc ugcagcaaca gcuucuacag aagcaugaga 480

uggcugacca agaagaacaa cagcuacccc gugcaggacg cccaguacac caacaacauc 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccaacac cacccagacc 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau ccacagaacc 660

uucaagcccc ugaucggccc cagacccccc gugaacggcc ugcugggcag aaucgacuac 720

uacugggccg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gccccuggu acggccacau ccugcugggc gagagccacg gcagaauccu gaagaccgac 840

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caggaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170366
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acgacggcac cagcaaggcc ugcagcggca gcuucuacag aaacaugaga 480

uggcugaccc agaagaacag cgacuacccc auccaggacg cccaguacac caacaaccag 540

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gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 170367
<211> 1683

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81162

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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

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aacgugagcu acgacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

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gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

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uga 1683

<210> 170368
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81164

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aacgugagcu acgacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacag cgacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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uga 1683

<210> 170369
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81167

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aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acaacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacag caacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagaagg gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

aagagagccc ugggcagcaa cgccguggag gacggcaagg gcugcuucga gcuguaccac 1440

aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170370
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81168

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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc cagagagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccaccc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagggcaa cgccuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagagag gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcaug 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

aagagagccc ugggcagcaa cgccguggag gacggcaagg gcugcuucga gcuguaccac 1440

aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170371
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81169

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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc cagagagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccaccc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaaggacaa cgccuacccc auccaggacg cccaguacac caacaaccag 540

gagaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgugcagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagagag gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcaug 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170372
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81170

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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc cagagagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccaccc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaaggacaa cgccuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagagag gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcaug 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170373
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81171

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gccaccagcc ugggccaccc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaaggacaa cgccuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcaug 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagagagccc ugggcagcaa cgccguggag gacggcaagg gcugcuucga gcuguaccac 1440

aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170374
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGQ81172

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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc cagagagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccaccc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaaggacaa cgccuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcaug 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170375
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81173

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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaaggacaa cgccuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcaug 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170376
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81175

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aacgugcccg ugacccacgc cagagagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccaccc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaaggacaa cgccuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagagag gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcaug 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

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hemagglutinin__InfluenzaA__AGQ81177

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gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acaacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugacca gaaagaacgg cgacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagagag gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170378
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acaacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugacca gaaagaacgg cgacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 170379
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acaacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacag caacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccuggguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170380
<211> 1683
<212> RNA
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hemagglutinin__InfluenzaA__AGQ81183

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gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acaacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacag caacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

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caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170381
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81184

<400> 170381

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ggcaacccca gcugcgaccu gcugcuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acgacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacag cgacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 170382
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGQ81185

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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaccugg 420

aacgugagcu acaacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacag caacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

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accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 170383
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGQ81186

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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acgacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacag cgacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccau cggccugaga aacgugccca gcagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 170384
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaaggacaa cgccuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcaug 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

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caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaaggacaa cgccuacccc auccaggacg cccaguacac caacaaccag 540

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aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcaug 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

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uggcugacca gaaagaacgg cgacuacccc auccaggacg cccaguacac caacaaccag 540

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gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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uga 1683

<210> 170387
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<212> RNA
<213> Artificial Sequence

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agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

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gcccccuggu acggccacgu gcugagcggc gagagccacg gcagaauccu gaagaccgac 840

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uga 1683

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<212> RNA
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agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

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aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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uga 1683

<210> 170389
<211> 1686
<212> RNA
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cccgccugcg accugcaccu gaccggcacc ugggacaccc ugaucgagag agagaacgcc 300

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gccggcacca ccagagccug caugagaaac ggcggcaaca gcuucuacgc cgagcugaag 480

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<210> 170390
<211> 1686
<212> RNA
<213> Artificial Sequence

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cccgccugcg accugcaccu gaccggcacc ugggacaccc ugaucgagag agagaacgcc 300

aucgccuacu gcuaccccgg cgccaccgug aacgaggagg cccugagaca gaagaucaug 360

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<210> 170391
<211> 1686
<212> RNA
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cccgccugcg accugcaccu gaccggcacc ugggacaccc ugaucgagag agagaacgcc 300

aucgccuacu gcuaccccgg cgccaccauc aacgaggagg cccugagaca gaagaucaug 360

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gccggcaaca ccaaggccug caugagaaac ggcggcaaca gcuucuacgc cgagcugaga 480

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agacugcccu uccagaaccu gagccccaga accgugggcc agugccccaa guacgugaac 960

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<211> 1686
<212> RNA
<213> Artificial Sequence

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cccgccugcg accugcaccu gaccggcacc ugggacaccc ugaucgagag agagaacgcc 300

aucgccuacu gcuaccccgg cgccaccgug aacgaggagg cccugagaca gaagaucaug 360

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gccggcacca ccaaggccug caugagaaac ggcggcaaca gcuucuacgc cgagcugaag 480

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caguacagag aggaggcccu gcugaacaga cugaacauca accccgugaa gcugagcagc 1560

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cccaugugcg acgaccugau cggcaagacc agcuggagcu acaucgugga gaagcccaac 300

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aaggagcacc aggaccugua caagaaggac agcagcuacg uggccguggg cagcgagacc 660

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cccaugugcg acgaccugau cggcaagacc agcuggagcu acaucgugga gaagcccaac 300

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cccaugugcg acgaccugau cggcaagacc agcuggagcu acaucgugga gaagcccaac 300

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gugaacagcg gcgccggcgu gaccgccgcc ugcaaguucg gcagcagcaa cagcuucuuc 480

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aaggagcacc aggaccugua caagaaggac agcagcuacg uggccguggg cagcgagacc 660

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ggcgccuucc uggcccccag auacgccuuc gagaucguga gcgugggcaa cggcaagcug 840

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accuucuacc acaagugcga caacgagugc aucgagagag ugagaaacgg caccuacgac 1500

cacaaggagu ucgaggagga gagcaagauc aacagacagg agaucgaggg cgugaagcug 1560

gacagcagcg gcaacgugua cagaauccug agcaucuaca gcugcaucgc cagcagccug 1620

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accgugacca gcagcgugga gcugguggag accgagcaca ccggcagcuu cugcagcauc 180

aacggcaagc agcccaucag ccugggcgac ugcagcuucg ccggcuggau ccugggcaac 240

cccaugugcg acggccugau cggcaagacc agcuggagcu acaucgugga gaagcccaac 300

cccgccaacg gcaucugcua ccccggcacc cuggagaacg aggaggagcu gagacugaag 360

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gugaacagcg gcgccggcgu gaccgccgcc ugcaaguucg gcagcagcaa cagcuucuuc 480

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aaggagcacc aggaccugua caagaaggac agcagcuacg uggccguggg cagcgagacc 660

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cuggugcugc uggagaacga gaagacccug gaccugcacg acagcaacgu gagaaaccug 1380

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accuucuacc acaagugcga caacgagugc aucgagagag ugagaaacgg caccuacgac 1500

cacaaggagu ucgaggagga gagcaagauc aacagacagg agaucgaggg cgugaagcug 1560

gacagcagcg gcaacgugua caagauccug agcaucuaca gcugcaucgc cagcagccug 1620

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accgugacca gcagcgugga gcugguggag accgagcaca ccggcagcuu cugcagcauc 180

aacggcaagc agcccaucag ccugggcgac ugcagcuucg ccggcuggau ccugggcaac 240

cccaugugcg acgaccugau cggcaagacc agcuggagcu acaucgugga gaagcccaac 300

cccgccaacg gcaucugcua ccccggcacc cuggagaacg aggaggagcu gagacugaag 360

uucagcggcg ugcuggaguu cagcaaguuc gaggccuuca ccagcaacgg cuggggcgcc 420

gugaacagcg gcgccggcgu gaccgccgcc ugcaaguucg gcagcagcaa cagcuucuuc 480

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aaggagcacc aggaccugua caagaaggac agcagcuacg uggccguggg cagcgagacc 660

uacaacagaa gauucauccc cgagaucagc accagaccca aggugaacgg ccaggccggc 720

agaaugaccu ucuacuggac caucgugaag cccggcgaga gcaucaccuu cgagagcaac 780

ggcgccuucc uggcccccag auacgccuuc gagaucguga gcgugggcaa cggcaagcug 840

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aucaacacca acaagagcuu ccacagcgug cacagaaaca ccaucggcga cugccccaag 960

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gagagcaccc agaaggccau cgaccagauc accagcaagg ugaacaacau cguggacaga 1200

augaacacca acuucgagag cgugcagcac gaguucagcg agaucgaggg cagaaucaac 1260

cagcugagca agcacgugga cgacagcgug guggacaucu ggagcuacaa cgcccagcug 1320

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accuucuacc acaagugcga caacgagugc aucgagagag ugagaaacgg caccuacgac 1500

cacaaggagu ucgaggagga gagcaagauc aacagacagg agaucgaggg cgugaagcug 1560

gacagcagcg gcaacgugua caagauccug agcaucuaca gcugcaucgc cagcagccug 1620

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ugcaccaucu gcaucuga 1698

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<212> RNA
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accgugacca gcagcgugga gcugguggag accgagcaca ccggcagcuu cugcagcauc 180

aacggcaagc agcccaucag ccugggcgac ugcagcuucg ccggcuggau ccugggcaac 240

cccaugugcg acggccugau cggcaagacc agcuggagcu acaucgugga gaagcccaac 300

cccgccaacg gcaucugcua ccccggcacc cuggagaacg aggaggagcu gagacugaag 360

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aaggagcagc aggaccugua caagaaggac agcagcuacg uggccguggg cagcgagacc 660

uacaacagaa gauucauccc cgagaucagc accagaccca aggugaacgg ccaggccggc 720

agaaugaccu ucuacuggac caucgugaag cccggcgaga gcaucaccuu cgagagcaac 780

ggcgccuucc uggcccccag auacgccuuc gagaucguga gcgugggcaa cggcaagcug 840

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cuggugcugc uggagaacga gaagacccug gaccugcacg acagcaacgu gagaaaccug 1380

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accuucuacc acaagugcga caacgagugc aucgagagag ugagaaacgg caccuacgac 1500

cacaaggagu ucgaggagga gagcaagauc aacagacagg agaucgaggg cgugaagcug 1560

gacagcagcg gcaacgugua caagauccug agcaucuaca gcugcaucgc cagcagccug 1620

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<210> 170404
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<212> RNA
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accgugacca gcagcgugga gcugguggag accgagcaca ccggcagcuu cugcagcauc 180

aacggcaagc agcccaucag ccugggcgac ugcagcuucg ccggcuggau ccugggcaac 240

cccaugugcg acgaccugau cggcaagacc agcuggagcu acaucgugga gaagcccaac 300

cccgccaacg gcaucugcua ccccggcacc cuggagaacg aggaggagcu gagacugaag 360

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gugaacagcg gcgccggcgu gaccgccgcc ugcaaguucg gcagcagcaa cagcuucuuc 480

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aaggagcacc aggaccugua caagaaggac agcagcuacg uggccguggg cagcgagacc 660

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agaaugaccu ucuacuggac caucgugaag cccggcgaga gcaucaccuu cgagagcaac 780

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accuucuacc acaagugcga caacgagugc aucgagagag ugagaaacgg caccuacgac 1500

cacaaggagu ucgaggagga gagcaagauc aacagacagg agaucgaggg cgugaagcug 1560

gacagcagcg gcaacgugua caagauccug agcaucuaca gcugcaucgc cagcagccug 1620

gugcuggccg cccugaucau gggcuucauc cugugggccu gcggcaacgg cagcugcaga 1680

ugcaccaucu gcaucuga 1698

<210> 170405
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hemagglutinin__InfluenzaA__AGQ81217

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accgugacca gcagcgugga gcugguggag accgagcaca ccggcagcuu cugcagcauc 180

aacggcaagc agcccaucag ccugggcgac ugcagcuucg ccggcuggau ccugggcaac 240

cccaugugcg acgaccugau cggcaagacc agcuggagcu acaucgugga gaagcccaac 300

cccgccaacg gcaucugcua ccccggcacc cuggagaacg aggaggagcu gagacugaag 360

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gugaacagcg gcgccggcgu gaccgccgcc ugcaaguucg gcagcagcaa cagcuucuuc 480

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aaggagcacc aggaccugua caagaaggac agcagcuacg uggccguggg cagcgagacc 660

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<210> 170406
<211> 1704
<212> RNA
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

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cacgaggcca gccugggcgu gagcgccgcc ugccccuacc agggcaacag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gaagggcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacaacgag 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

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accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caucuaccag auccugagca ucuacagcac cguggccagc 1620

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<210> 170407
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR33888

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

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ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

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aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

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uga 1683

<210> 170408
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR33889

<400> 170408
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170409
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR33890

<400> 170409
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170410
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGR33892

<400> 170410
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucaa caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagaug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcguggag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170411
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR33895

<400> 170411
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccagcauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucgu gaaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccccauga ccaagagcua caagaacacc 540

agaaaggccc ccgccaucau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccguga gaagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccggcccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagca gaggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagug gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucaaccagau gaccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga ugaacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 170412
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR33897

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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acgacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacag cgacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagaagg gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

aagagagccc ugggcagcaa cgccguggag gacggcaagg gcugcuucga gcuguaccac 1440

aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170413
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR33899

<400> 170413
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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acaacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacag caacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagaagg gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagagagccc ugggcagcaa cgccguggag gacggcaagg gcugcuucga gcuguaccac 1440

aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagcaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170414
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR33900

<400> 170414
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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acaacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacag cgacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 170415
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR33902

<400> 170415
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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaccugg 420

aacgugagcu acaacggcau cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacag caacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagagag gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccuggguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

aagagagccc ugggcagcaa cgccguggag gacggcaagg gcugcuucga gcuguaccac 1440

aagugcgaca accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<400> 170417

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccagag acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgugaacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 170420
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170421
<211> 1701

<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170422
<211> 1701
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<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170423
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGR49912

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170424
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170425
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR49936

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccggc 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170426
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR49948

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccagg ugcuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgaggugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170427
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGR49960

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170428
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGR49972

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggaccauc guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170429
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR49983

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacaagg agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170430
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR49995

<400> 170430
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacaagg agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170431
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR50007

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170432
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR50018

<400> 170432
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170433
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170434
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR50040

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ugggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170435
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR50052

<400> 170435

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170436
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR50063

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170437
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR50074

<400> 170437
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170438
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR50085

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170439
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR50096

<400> 170439
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170440
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR50107

<400> 170440
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170441
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR50118

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170442
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR50129

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggccagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170443
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR50140

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170444
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR50151

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170445
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR50162

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacaagg agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170446
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGR50174

<400> 170446
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170447
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<220>
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hemagglutinin__InfluenzaA__AGR50185

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 170448
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR50196

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170449
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaga gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170450
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR50218

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170451
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170452
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR50240

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170453
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGR50251

<400> 170453

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcuga uccugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170454
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGR50262

<400> 170454
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaag acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170455
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<212> RNA
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hemagglutinin__InfluenzaA__AGR50273

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170456
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AGR50284

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacag ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170457
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AGR50295

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170458
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGR50306

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170459
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR50317

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170460
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGR50328

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaga gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170461
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR50339

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170462
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGR50350

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gaucaugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170463
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGR50361

<400> 170463
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 170464
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGT18718

<400> 170464
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170465
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGT18720

<400> 170465
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccaac 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagagaagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170466
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18721

<400> 170466
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cauccagaga agcgagaucu gcaccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccagaac 600

agcagaggcc accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gaaggagcag 720

gacggcagaa uggacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170467
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18722

<400> 170467
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aagagcaaca acagaaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170468
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18723

<400> 170468
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aagaccaaca acagaaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccagaac 600

aagaaggccg agcagcagac ccccuaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa uggacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170469
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18724

<400> 170469
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggugccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aagaccaaca acagaaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagac ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cagaacccug aucgagcccg agaacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170470
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18725

<400> 170470
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aacccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170471
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18734

<400> 170471

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ucaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170472
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18735

<400> 170472
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170473
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18748

<400> 170473
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacga ggagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcagaag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170474
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18749

<400> 170474
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccga cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucagaaucag aagcggcaga 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170475
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18751

<400> 170475
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaga 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaag 1320

agcgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170476
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18752

<400> 170476
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaga 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacagc 1320

agcgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170477
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18753

<400> 170477
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaga 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaag 1320

agcgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170478
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGT18754

<400> 170478
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccga cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagagg caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccacc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaga 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170479
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18756

<400> 170479
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcagaag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaag 1320

agcgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170480
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18757

<400> 170480
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcagaag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170481
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18758

<400> 170481
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcagaag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacagc 1320

agcgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacaccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccuggugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170482
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGT18759

<400> 170482
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcagaag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacagc 1320

agcgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccuggugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170483
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18760

<400> 170483
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaaa caaggccuac agcaacugcu accccuacga cgugcccgac 360

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaag 1320

agcgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccuggugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170484
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT18761

<400> 170484
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcagaag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacagc 1320

agcgaguucc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccuggugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170485
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGT37102

<400> 170485
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ugcgugggcu accacgccaa caacagcacc gacaccgugg acaccaucau ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugcagc 180

cugaacggca aggccccccu gcagcugggc aacugcaacg uggccggcug gauccugggc 240

aaccccgagu gcgaccugcu gcugaccgcc aacagcugga gcuacaucau cgagaccagc 300

agcagcaaga acggcaccug cuaccccggc gaguucagcg acuacgagga gcugagagag 360

cugcugagca ccgugagcag cuucgagaga uucgagaucu uccccaaggc caccagcugg 420

cccaaccacg agaccaccaa gggcgccacc aucgccugca gccacagcgg cgccagcagc 480

uucuacagaa accugcugug gaucgugaag aagggcaaca gcuaccccaa gaucagcaag 540

agcuacacca acaacagagg caaggaggug cuggugaucu ggggcgugca ccacccccc 600

accgacagca gccagcaggc ccuguaccag aacacccaca ccuacaucag cgugggcagc 660

agcaaguacu accagagauu cacccccgug guggccgcca gacccaagau cagagagcag 720

gagggcagaa ugaacuacua cuggacccug cuggagcagg gcgacaccau caccuucgag 780

gccaccggca accugaucgc ccccugguac gccuucgccc uggacauggg cagcagcagc 840

ggcaucaugg ugagcgacgc ccccgugcac aacugcacca ccaagugcca gaccccccac 900

ggcgcccuga agagcaaccu gcccuuccag aacgugcacc ccaucaccau cggcgagugc 960

cccaaguacg ugaagagcac ccagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagau cgccaucgac ggcaucagca acaaggugaa cagcaucauc 1200

gagaagauga acgugcaguu caccagcgug ggcaaggagu ucaacgaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacuu caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug agaaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac gagugcaugg agaacgugaa gaacggcacc 1500

uacaacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaucggcgu gcaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170486
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU01877

<400> 170486
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170487
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU01878

<400> 170487
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170488
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU01879

<400> 170488
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacgagaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170489
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU01881

<400> 170489

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugacccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170490
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU01883

<400> 170490
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acaacaagga gaaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170491
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU01884

<400> 170491
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 170492
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU01885

<400> 170492
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacgagaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170493
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU01887

<400> 170493
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgccg uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170494
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGU01888

<400> 170494
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acaccagauu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170495
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU01889

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170496
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGU01890

<400> 170496
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170497
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU92645

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgagacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170498
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU92667

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170499
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU92678

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ugcaucggcc accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170500
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGU92711

<400> 170500
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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uucuacaaga accugaucug gcuggugaag cagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170501
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU92722

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170502
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hemagglutinin__InfluenzaA__AGU92733

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170503
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hemagglutinin__InfluenzaA__AGU92744

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcgcc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170504
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGU92755

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaaggaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170505
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGU92766

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170506
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGU92777

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag caucuaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 170507
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGU92788

<400> 170507

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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augcuggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 170508
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGU92799

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170509
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGU92821

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagauguu caagcccgag aucgccacca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 170510
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGU92843

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170511
<211> 1710

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGU92854

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gaccagccug cccuuccaga acauccaccc caucaccauc 960

ggcaagugcc ccaaguacgu gaagagcacc aagcugagac uggccaccgg ccugagaaac 1020

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uggaccggca ugguggacgg cugguacggc uaccaccacc agaacgagca gggcagcggc 1140

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gagaagagaa ucgagaaccu gaacaagaag guggacgacg gcuuccugga caucuggacc 1320

uacaacgccg agcugcuggu gcugcuggag aacgagagaa cccuggacua ccacgacagc 1380

aacgugaaga accuguacga gaaggugaga agccagcuga agaacaacgc caaggagauc 1440

ggcaacggcu gcuucgaguu cuaccacaag ugcgacaaca ccugcaugga gagcgugaag 1500

aacggcaccu acgacuaccc caaguacagc gaggaggcca agcugaacag agaggagauc 1560

gacggcguga agcuggagag caccagaauc uaccagaucc uggccaucua cagcaccgug 1620

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ggcagccugc agugcagaau cugcaucuga 1710

<210> 170512
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGU92887

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgacg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170513
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGU92898

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgagacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 170514
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGU92909

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga gcccuggacu accacgacag caacgugaag 1380

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cagugcagaa ucugcaucug a 1701

<210> 170515
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGU92931

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170516
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGU92942

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170517
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<220>
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hemagglutinin__InfluenzaA__AGU92953

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170518
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augcuggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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<210> 170519
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AGU92975

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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<210> 170520
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170521
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGU92997

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagauguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170522
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGU93008

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgacg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170523
<211> 1698
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGU93019

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

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<210> 170524
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGU93031

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 170525
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGU93042

<400> 170525

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc aacagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170526
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGU93053

<400> 170526
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 170527
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AGV99014

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170528
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGV99037

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170529
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGV99049

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guggugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacggcaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170530
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGV99073

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agcccggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170531
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGV99085

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170532
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGV99097

<400> 170532
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagaucc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170533
<211> 1701
<212> RNA
<213> Artificial Sequence

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170534
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGV99133

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170535
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170536
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cacccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170537
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGV99169

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170538
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGV99181

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170539
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGV99193

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cacccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170540
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGV99956

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170541
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170542
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW00065

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacaccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170543
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 170543

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170544
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00089

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170545
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW00101

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170546
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00113

<400> 170546
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaccuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170547
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00125

<400> 170547
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170548
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00137

<400> 170548
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170549
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00149

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170550
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00161

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170551
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00173

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170552
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00185

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170553
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00709

<400> 170553
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170554
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGW00721

<400> 170554
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170555
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00733

<400> 170555
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170556
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00745

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170557
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00757

<400> 170557
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaaccuga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170558
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00769

<400> 170558
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170559
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00781

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170560
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00793

<400> 170560
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacaccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170561
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00805

<400> 170561

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170562
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00817

<400> 170562
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170563
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00829

<400> 170563
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170564
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00841

<400> 170564
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cggcagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170565
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00853

<400> 170565
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170566
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00865

<400> 170566
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170567
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00877

<400> 170567
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuucagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170568
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00889

<400> 170568
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg gugcugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170569
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00901

<400> 170569
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170570
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00913

<400> 170570
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170571
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW00931

<400> 170571
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170572
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGW01244

<400> 170572
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170573
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW01256

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170574
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagaucc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170575
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01307

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170576
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01319

<400> 170576
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacaagcug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170577
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGW01331

<400> 170577
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgagc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170578
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01343

<400> 170578
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170579
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW01355

<400> 170579

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170580
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW01367

<400> 170580
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170581
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01391

<400> 170581
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170582
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01403

<400> 170582
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170583
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01415

<400> 170583
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170584
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01427

<400> 170584
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170585
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01439

<400> 170585
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170586
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01451

<400> 170586
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggug gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170587
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01463

<400> 170587
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170588
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW01475

<400> 170588
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170589
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01487

<400> 170589
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg gcaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170590
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGW01499

<400> 170590
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170591
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01511

<400> 170591
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcgccgcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170592
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01535

<400> 170592
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caaggagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170593
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01547

<400> 170593
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170594
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01559

<400> 170594
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170595
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170596
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170597
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW01595

<400> 170597

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170598
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170599
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW01619

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170600
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AGW01631

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170601
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01643

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170602
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01655

<400> 170602
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170603
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<212> RNA
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hemagglutinin__InfluenzaA__AGW01667

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacgag 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170604
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AGW01679

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170605
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc gugauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170606
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW01701

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170607
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01713

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170608
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AGW01725

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170609
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01737

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170610
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01749

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170611
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170612
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170613
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170614
<211> 1701
<212> RNA
<213> Artificial Sequence

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170615
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGW01809

<400> 170615

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170616
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW01821

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaugcaaca ucugcaucug a 1701

<210> 170617
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW01833

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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agaugcaaca ucugcaucug a 1701

<210> 170618
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01845

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170619
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170620
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170621
<211> 1701
<212> RNA
<213> Artificial Sequence

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc gugauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170622
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170623
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGW01905

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaugcaaca ucugcaucug a 1701

<210> 170624
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW01917

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170625
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW01929

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170626
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 170626
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170627
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01953

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170628
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01965

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ggcaacgacg acagcauggc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgacugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170629
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170630
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW01989

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170631
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW02001

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170632
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW02013

<400> 170632
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170633
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW02025

<400> 170633

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170634
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170635
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170636
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170637
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170638
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170639
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170640
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGW02133

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170641
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGW02157

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cgacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

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cacgaggcca gccugggcgu gagcgccgcc ugcagcuacc agggcaacag cagcuucuuc 480

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc uacuucgacg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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aucggcaacc agagaacccu guaccacacc gagaacaccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 170658
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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170660
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170661
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hemagglutinin__InfluenzaA__AHC58017

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 170662
<211> 1701
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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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<210> 170663
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aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 170664
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHC58074

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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hemagglutinin__InfluenzaA__AHC58098

<400> 170665
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170666
<211> 1701
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<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHC58110

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170667
<211> 1701
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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170668
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170669
<211> 1701
<212> RNA
<213> Artificial Sequence

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<400> 170669

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170670
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC58186

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170671
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC58198

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 170672
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC58210

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170673
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<212> RNA
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170674
<211> 1701
<212> RNA
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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170675
<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170676
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170677
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugacc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170678
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC58396

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170679
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC58408

<400> 170679
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 170680
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170682
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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170683
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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 170684
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 170685
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 170686
<211> 1701
<212> RNA
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aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 170687
<211> 1701
<212> RNA
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<400> 170687

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aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 170688
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHC58527

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aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170697
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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170698
<211> 1701
<212> RNA
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<220>
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170699
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170700
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHC58707

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170701
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHC58719

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170702
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC58731

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 170703
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC58743

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170704
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC58755

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170705
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<400> 170705

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170706
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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugacc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170707
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga ucaucgacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucaa gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170708
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHC58815

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cggcaacugc 240

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170709
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC58827

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170710
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC58839

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaugcaaca ucugcaucug a 1701

<210> 170711
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC58863

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugag caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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<210> 170712
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC58875

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170713
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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170714
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170715
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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170716
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170717
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHC59005

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170718
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHC59017

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 170719
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHC59029

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170720
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHC59041

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170721
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugga ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170722
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59077

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170723
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170724
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59101

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170725
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59113

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170726
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59125

<400> 170726
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170727
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59137

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugag caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170728
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59149

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170729
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59185

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170730
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59197

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170731
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59209

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcgagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgccgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170732
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59221

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170733
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59245

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugag caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170734
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHC59257

<400> 170734
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170735
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59269

<400> 170735
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170736
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59281

<400> 170736
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170737
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59293

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170738
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59305

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcagcagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170739
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59329

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg agaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170740
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59341

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170741
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59365

<400> 170741

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170742
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59377

<400> 170742
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccaga accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170743
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59413

<400> 170743
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170744
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHC59425

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170745
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59437

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170746
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcagaa ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170747
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59461

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170748
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59473

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg agaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170749
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59485

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170750
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59497

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170751
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59509

<400> 170751
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170752
<211> 1701
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170754
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170755
<211> 1701
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170756
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59569

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170757
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHC59581

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170758
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59593

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170759
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59605

<400> 170759

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170760
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59617

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170761
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59629

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170762
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59641

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170763
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59653

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcacccaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170764
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59665

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170765
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59677

<400> 170765
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170766
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59689

<400> 170766
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcacccaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170767
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59701

<400> 170767
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170768
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 170768
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170769
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59737

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga ucaucgacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170770
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHC59749

<400> 170770
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170771
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59761

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170772
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59773

<400> 170772
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170773
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59785

<400> 170773
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170774
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59797

<400> 170774
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170775
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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170776
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gccugcagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugg uggagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170777
<211> 1701
<212> RNA
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<400> 170777

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170778
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugacc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170779
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170780
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59869

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170781
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59881

<400> 170781
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170782
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59892

<400> 170782
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170783
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59904

<400> 170783
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170784
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC59915

<400> 170784
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170785
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59939

<400> 170785
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170786
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59963

<400> 170786
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acaucaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170787
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC59987

<400> 170787
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170788
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHC59999

<400> 170788
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170789
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60011

<400> 170789
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170790
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60023

<400> 170790
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<212> RNA
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aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170799
<211> 1701

<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170800
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60143

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cggcaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170801
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHC60155

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcccca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170802
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170803
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60179

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170804
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60191

<400> 170804
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170805
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60203

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170806
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHC60215

<400> 170806
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170807
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHC60239

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170808
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170809
<211> 1701
<212> RNA
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ggcaacgaga acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170810
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170811
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga ucaucgacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucaa gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170812
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60299

<400> 170812
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170813
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60311

<400> 170813

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucga caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170814
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60323

<400> 170814
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170815
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170816
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60347

<400> 170816
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170817
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170818
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg agaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170819
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60383

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170820
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60395

<400> 170820
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170821
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60407

<400> 170821
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170822
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60419

<400> 170822
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170823
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60431

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170824
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHC60455

<400> 170824
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170825
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60467

<400> 170825
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170826
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60479

<400> 170826
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugacc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170827
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60491

<400> 170827
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170828
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60503

<400> 170828
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170829
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHC60515

<400> 170829
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170830
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHC60527

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170831
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60539

<400> 170831

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170832
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60551

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga ucaucgacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170833
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60563

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170834
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60575

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170835
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60587

<400> 170835
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccaga accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170836
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60599

<400> 170836
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170837
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60611

<400> 170837
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170838
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170839
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170840
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60647

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170841
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60659

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170842
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHC60671

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170843
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60683

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ucagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170844
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60695

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170845
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC60707

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccga cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg aucaucugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170846
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170847
<211> 1701
<212> RNA
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170848
<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170849
<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170850
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHC60779

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaga 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170851
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60791

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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<210> 170852
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60803

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugag caacggcacc 120

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 170853
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60815

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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hemagglutinin__InfluenzaA__AHC60827

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agcagcagca ccgacgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ccggcgagau cugcgacagc ccccaccaga ucaucgacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170856
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170857
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<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga aggccggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170858
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHC60875

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170859
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60887

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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<210> 170860
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 170861
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHC60911

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170862
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHC60923

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170863
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170864
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170865
<211> 1701
<212> RNA
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<220>
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170866
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHC60971

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170867
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC60983

<400> 170867

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170868
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61007

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170869
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHC61019

<400> 170869
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170870
<211> 1701
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170871
<211> 1701

<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170872
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170873
<211> 1701
<212> RNA
<213> Artificial Sequence

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170874
<211> 1701
<212> RNA
<213> Artificial Sequence

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 170875
<211> 1701
<212> RNA
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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<210> 170876
<211> 1701
<212> RNA
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170877
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hemagglutinin__InfluenzaA__AHC61127

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170878
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcacccaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170879
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170880
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccguggug cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170881
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61175

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170882
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61187

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170883
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHC61199

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170884
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61211

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170886
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<212> RNA
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170888
<211> 1701
<212> RNA
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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170889
<211> 1701

<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170890
<211> 1701
<212> RNA
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<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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<210> 170891
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHC61295

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 170892
<211> 1701
<212> RNA
<213> Artificial Sequence

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170895
<211> 1701
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170896
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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170897
<211> 1701
<212> RNA
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aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170898
<211> 1701
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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<210> 170899
<211> 1701
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hemagglutinin__InfluenzaA__AHC61391

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

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<210> 170900
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<212> RNA
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<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugcagcagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170901
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caacaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ucagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

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<212> RNA
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170904
<211> 1701
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170905
<211> 1701
<212> RNA
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170906
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61475

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170907
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61487

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170908
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61499

<400> 170908
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170909
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHC61511

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170910
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170911
<211> 1701
<212> RNA
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

accaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170912
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61547

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170913
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61559

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aacagcagca ccggcgagau cugcgacagc ccccaccaga ucaucgacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucagaaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcca caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170914
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 170914
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170915
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61583

<400> 170915
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170916
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61595

<400> 170916
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170917
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<212> RNA
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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gcacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170918
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170919
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

accaucaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170920
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170921
<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ucagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170922
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61667

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170923
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61679

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170924
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61691

<400> 170924
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170925
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61703

<400> 170925
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170926
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61715

<400> 170926
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugag caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170927
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61727

<400> 170927
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170928
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61739

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170929
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61751

<400> 170929
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacgugg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170930
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61763

<400> 170930
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170931
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61775

<400> 170931
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170932
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 170932
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170933
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170934
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc gacaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170935
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61835

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170936
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61847

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170937
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHC61859

<400> 170937
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170938
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61871

<400> 170938
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170939
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61883

<400> 170939

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accuggccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170940
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61895

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170941
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61907

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170942
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC61931

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caagggcugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170943
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61943

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170944
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61955

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170945
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61967

<400> 170945
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170946
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61979

<400> 170946
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170947
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC61991

<400> 170947
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170948
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHC62003

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170949
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHC62015

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170950
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170951
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC62039

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170952
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62050

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacgugccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170953
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62062

<400> 170953
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170954
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC62074

<400> 170954
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaaaccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170955
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHC62086

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170956
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170958
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucag aaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170959
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHC62134

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170960
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC62146

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170961
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC62158

<400> 170961
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 170962
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62170

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170963
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC62182

<400> 170963
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170964
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62194

<400> 170964
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170965
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHC62206

<400> 170965
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaucugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170966
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62218

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170967
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62242

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugaucgcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170968
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHC62254

<400> 170968
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugacc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170969
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62266

<400> 170969
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170970
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62278

<400> 170970
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170971
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62290

<400> 170971
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170972
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62302

<400> 170972
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170973
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHC62314

<400> 170973
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucagaggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170974
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62326

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170975
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62338

<400> 170975

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170976
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62350

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170977
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62362

<400> 170977
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170978
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62374

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170979
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62386

<400> 170979
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170980
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62398

<400> 170980
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170981
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62410

<400> 170981
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ucagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170982
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62422

<400> 170982
augaagaccg ugaucgcccu gagcuacauc cugugccugg ccuucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170983
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62434

<400> 170983
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170984
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62446

<400> 170984
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170985
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHC62458

<400> 170985
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170986
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHC62470

<400> 170986
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacgg caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 170987
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg agaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170988
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<212> RNA
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170989
<211> 1701
<212> RNA
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 170990
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<212> RNA
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 170991
<211> 1701
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 170993
<211> 1701
<212> RNA
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<220>
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<400> 170993

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 170994
<211> 1701
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcaacagc ccccaccaga ucaucgacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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hemagglutinin__InfluenzaA__AHC62626

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171000
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHC62650

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 171001
<211> 1701
<212> RNA
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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 171002
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacaccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171003
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37972

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171004
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171004
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg caccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ucaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 171005
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37974

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171006
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37975

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171007
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37976

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcgccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcaaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171008
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37977

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 171009
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHE37978

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171010
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHE37979

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171011
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37980

<400> 171011

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugacccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171012
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37981

<400> 171012
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acauccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171013
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHE37982

<400> 171013
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171014
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37983

<400> 171014
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcgag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171015
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37984

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171016
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHE37985

<400> 171016
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171017
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHE37986

<400> 171017
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171018
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37987

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171019
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37988

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccaga accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171020
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37989

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171021
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37990

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171022
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171023
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE37992

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucga caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171024
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHE38023

<400> 171024
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 171025
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHE38024

<400> 171025
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171026
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHE38026

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgagaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171027
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171028
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHF20558

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

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uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugcag aacggcaaca ugagaugcac caucggcauc 1680

uga 1683

<210> 171029
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHF20568

<400> 171029

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caugagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 171030
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96108

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171031
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96120

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171032
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96132

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171033
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96144

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgugc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171038
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hemagglutinin__InfluenzaA__AHG96204

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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<212> RNA
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hemagglutinin__InfluenzaA__AHG96216

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 171040
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<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 171041
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96240

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgugc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171042
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96252

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171045
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96288

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171046
<211> 1698
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHG96300

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

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aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 171047
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96312

<400> 171047

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggugccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171048
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHG96313

<400> 171048
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171049
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96314

<400> 171049
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccagua caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171050
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96315

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171051
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96316

<400> 171051
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171052
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96317

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171053
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96320

<400> 171053
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171054
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96321

<400> 171054
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171055
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96322

<400> 171055
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171056
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96324

<400> 171056
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171057
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96325

<400> 171057
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171058
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHG96326

<400> 171058
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171059
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96327

<400> 171059
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171060
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96329

<400> 171060
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaagaucag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgaguacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171061
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96330

<400> 171061
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaccgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugagc cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaagaucag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171062
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96332

<400> 171062
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171063
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHG96334

<400> 171063
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171064
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96335

<400> 171064
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171065
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96336

<400> 171065

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugaga gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171066
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96338

<400> 171066
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugca gccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171067
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96339

<400> 171067
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171068
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96340

<400> 171068
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171069
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96341

<400> 171069
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171070
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96342

<400> 171070
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171071
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96343

<400> 171071
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171072
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96344

<400> 171072
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171073
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96345

<400> 171073
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171074
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96346

<400> 171074
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171075
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96347

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171076
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHG96348

<400> 171076
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171077
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96349

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171078
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96350

<400> 171078
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171079
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96351

<400> 171079
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171080
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96352

<400> 171080
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171081
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHG96353

<400> 171081
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171082
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96354

<400> 171082
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171083
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96355

<400> 171083

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccagcu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171084
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96356

<400> 171084
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171085
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96359

<400> 171085
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171086
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96371

<400> 171086
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171087
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96383

<400> 171087
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171088
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96395

<400> 171088
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171089
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96407

<400> 171089
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171090
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96419

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171091
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96431

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171092
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96443

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171093
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96455

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171094
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHG96467

<400> 171094
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171095
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96479

<400> 171095
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccagcuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 171098
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171100
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
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hemagglutinin__InfluenzaA__AHG96551

<400> 171101

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHG96563

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

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aucggcgugc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 171103
<211> 1698
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHG96575

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171111
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96671

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 171112
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171112
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171113
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHG96695

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171114
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171115
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96719

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171116
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96731

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171117
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHG96743

<400> 171117
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171118
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96755

<400> 171118
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171119
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<400> 171119

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171120
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171121
<211> 1701
<212> RNA
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccagcuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagaga 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171122
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171123
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96815

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171124
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96827

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaugcaaca ucugcaucug a 1701

<210> 171125
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96839

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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agaugcaaca ucugcaucug a 1701

<210> 171126
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96851

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171127
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96863

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171128
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96875

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171129
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171130
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171131
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG96911

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171132
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96923

<400> 171132
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171133
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96935

<400> 171133
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171134
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG96947

<400> 171134
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171135
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171136
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 171137
<211> 1701
<212> RNA
<213> Artificial Sequence

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<400> 171137

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171138
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171139
<211> 1701
<212> RNA
<213> Artificial Sequence

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 171140
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG97019

<400> 171140
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

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cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 171141
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHG97031

<400> 171141
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171142
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHG97043

<400> 171142
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171143
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHH00866

<400> 171143
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcugg agaacagaua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagcgug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga accccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacaagcug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171144
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHH00870

<400> 171144
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcugg agaacagaua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagcgug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacaagcug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171145
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57430

<400> 171145
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaga 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagauca gccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugaga gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccgccagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcaacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171146
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57431

<400> 171146
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugaga gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171147
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57432

<400> 171147
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagccccag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgccc uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggagg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171148
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHJ57433

<400> 171148
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171149
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57434

<400> 171149
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacccccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171150
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57435

<400> 171150
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacag aggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171151
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57436

<400> 171151
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca uccccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagcug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171152
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57437

<400> 171152
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugaaggaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171153
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57438

<400> 171153
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaaguggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgac 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ccggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagguga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171154
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57651

<400> 171154
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacaccg acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcauccug uacuucuggg gcgugcacca ccccccgug 600

accaccgagc aggaggcccu guacggcagc ggcgacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcacccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacagagaga gcacccagaa ggccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggaca ugcacgacgc caacgugaag 1380

auccuguacg agaaggugag aagccagcug agagacaacg ccaaggaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaucg agagcgugaa gaacggcacc 1500

uacaacuacc ccaaguacca gagcgagagc agacugaaca gacagaccau cgagagcgug 1560

aagcuggaga accugggcgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau ccuggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171155
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57663

<400> 171155

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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cuggaccggc 420

guggacaccg agagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcauccug uacuucuggg gcgugcacca ccccccgug 600

accaccgagc agaacgcccu guacggcagc ggcgacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agagagugaa gagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

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uacaacuacc ccaaguacca ggccgagagc agacugaaca agcagaagau cgagagcgug 1560

aagcuggagg aguucggcgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccaug ggccugugga ugugccccaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171156
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHJ57674

<400> 171156
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcgagggccc cagcuucuac 480

agaaaccugc uguggaucau caagcacacc accagcggcu accccgugau caagggcacc 540

uacagaaaca ccggcgacaa gagcgugcug uacuucuggg gcgugcacca ccccccgac 600

accaccgagc agaacgugcu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agagagugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacaacuacc ccaaguacca ggccgagagc agacugaaca gacagaagau cgagagcgug 1560

aagcuggagg aguucggcgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171157
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57686

<400> 171157
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accgugaccc acagcgugga gcugcuggag aaccagaagg agggcagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcauc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgccu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcauccug uacuucuggg gcgugcacca ccccccgug 600

gccaccgagc aggaggcccu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaaa ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgagg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac gagaacagcc agggcagcgg cuacgccgcc 1140

gacagagaga gcacccagaa ggccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca ggccgagagc agacugaaca gacagaagau cgagagcgug 1560

aagcuggaga acuucgacgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171158
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57697

<400> 171158
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcauccug uacuucuggg gcgugcacca ccccccgug 600

accaccgagc aggaggcccu guacggcagc ggcgacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac gagaacagcc agggcagcgg cuacgccgcc 1140

gacagagaga gcacccagaa ggccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugaa gagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca ggccgagagc agacugaaca gacagaagau cgagagcgug 1560

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cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171159
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57707

<400> 171159
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gugggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cuggaccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcgagggccc cagcuucuac 480

agaaaccugc uguggaucau caagcacacc accagcggcu accccgugau caagggcacc 540

uacagaaaca ccggcgacaa gagcgugcug uacuucuggg gcgugcacca cccccccgac 600

accaccgagc agaacgugcu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac gagaacagcc agggcagcgg cuacgccgcc 1140

gacagagaga gcacccagaa ggccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agagagugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacaacuacc ccaaguacca ggccgagagc agacugaaca agcagaagau cgagagcgug 1560

aagcuggagg aguucggcgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171160
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57719

<400> 171160
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu gagcgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcauc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuuc 480

agaaaccugc uguggaucau caagcugaag agcagcaccu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcauccug uacuucuggg gcgugcacca ccccagcgug 600

accaccgagc aggaggcccu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaucgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaaggaga gcacccagaa ggccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca ggccgagagc agacugaaca gacagaagau cgagagcgug 1560

aagcuggaga acuucgacgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171161
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57731

<400> 171161
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcauc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacaccg acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcauccug uacuucuggg gcgugcacca cccccccgug 600

accaccgagc aggaggcccu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac gagaacagcc agggcagcgg cuacgccgcc 1140

gacagagaga gcacccagaa ggccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca gaccgagagc agacugaaca gacagaagau cgagagcgug 1560

aagcuggaga acuucgacgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171162
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57743

<400> 171162
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcaccaucg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccgac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagaaggu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca gcagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcgugcug uacuucuggg gcgugcacca ccccccgug 600

accaccgagc agaacgcccu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaucgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgcc ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugaa gagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

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uacgacuacc ccaaguacca gaaggagagc agacugaaca gacagaagau cgagagcgug 1560

aagcuggaga acuucgacgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171163
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57755

<400> 171163
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcaccaucg agggcuggau ccugggcaac 240

cccagaugcg acauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagggcgu ggagagauuc gagauguucc ccaagagcac cugggugggc 420

guggacacca gcagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

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agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga caacaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgcc ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugaa gagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

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cugguggugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171164
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57767

<400> 171164
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcauccug uacuucuggg gcgugcacca ccccccgug 600

accaccgagc aggaggcccu guacggcagc ggcgacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca gaaggagagc agacugaaca gacagaagau cgagagcgug 1560

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cuggugcugg ugggccugau ccuggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171165
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57779

<400> 171165
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag gaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcaccaucg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagggcgu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcgugcug uacuucuggg gcgugcacca ccccccgug 600

accaccgagc agaacgcccu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac gagaacagcc agggcagcgg cuacgccgcc 1140

gacagagaga gcacccagaa ggccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgcc ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugaa gagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca gaaggagagc agacugaaca gacagaagau cgagagcgug 1560

aagcuggaga acuucgacgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcauga ucugcaucug a 1701

<210> 171166
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHJ57791

<400> 171166
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aacaagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg ugaaggagcu gaaggcccug 360

aucggcagcg gcgagagagu gaagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcagc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcacacc accagcggcu accccgugau caagggcacc 540

uacaccaaca ccggcgacaa gagcgugcug uacuucuggg gcauccacca cccccccgac 600

accaccgagc agaacgugcu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag gacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaccc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agagagugaa gagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

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uacaacuacc ccaaguacca ggccgagagc agacugaaca agcagaagau cgagagcgug 1560

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cuggugcugg ugggccugau cauggccaug gugcugugga ugugcagcaa cggcagcaug 1680

cagugcagag ugugcaucug a 1701

<210> 171167
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57815

<400> 171167
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcagaauc 180

agcaacaagg ccccccugga ccugaaggag ugcacccugg agggcuggau ccugggcaac 240

ccccagugcg accugcugcu gggcgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gagagcccug 360

aucggcagcg gcgagggcgu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagaggcgu gaccagcagc ugccccuucg gcagcggcag cagcuucuac 480

agaaaccugc uguggaucgu gaagcacacc accagcagcu accccgugau caagggcacc 540

uucagaaaca ccggcgacaa gagcgugcug uacuucuggg gcgugcacca ccccuucgac 600

accaacgagc agaacgugcu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagagg ccccgaggug gccgccagac ccguggugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa caucgagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag gacugcgacg ccaccugcca gaccaucgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcga gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac gagaacagcc agggcagcgg cuacgccgcc 1140

gacagagaga gcacccagaa ggccaucgac ggcaucacca ccaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agagagugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacaacuacc ccaaguacca ggccgagagc agacugaaca agcagagaau cgagagcgug 1560

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cuggugcugg ugggccugau ccuggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171168
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57827

<400> 171168
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcaccaucg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagaccaag agcagcgagu accccgugau caagggcacc 540

uucaacaaca ccggcgacaa gagcgugcug uacuucuggg gcgugcacca cccccccagc 600

agaaacgagc agaacgugcu guacggcagc ggcgacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcagaggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccgccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

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cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171169
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57850

<400> 171169
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcauc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacaccg acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

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accaccgagc aggaggcccu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaac ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca ggccgagagc agacugaaca gacagaagau cgagagcgug 1560

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cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171170
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57862

<400> 171170
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcauc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

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agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca ggccgagagc agacugaaca gacagaagau cgagagcgug 1560

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cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171171
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHJ57873

<400> 171171
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augggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cuggaccggc 420

guggacaccg agagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

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aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

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uacgacuacc ccaaguacca gaaggagagc agacugaaca gacagaagau cgagagcgug 1560

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cuggugcugg ugggccugau ccuggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cacugcagaa ucugcaucug a 1701

<210> 171172
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57885

<400> 171172
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcauc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacaccg acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagagaaag agcagcgccu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcauccug uacuucuggg gcgugcacca ccccccgug 600

accaccgagc aggaggcccu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaaa ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa caucgagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag gacugcgacg ccagcugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc uggacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca ggccgagagc agacugaaca gacagaagau cgagagcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 171173
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57897

<400> 171173

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accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcauc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacaccg acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagagaaag agcagcgccu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcauccug uacuucuggg gcgugcacca ccccccgug 600

accaccgagc aggaggcccu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaaa ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa caucgagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag gacugcgacg ccagcugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac gagaacagcc agggcagcgg cuacgccgcc 1140

gacagagaga gcacccagaa ggccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca ggccgagagc agacugaaca gacagaagau cgagagcgug 1560

aagcuggaga acuucgacgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171174
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHJ57908

<400> 171174
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accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcaccgugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugau cgccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagggcgu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca gcagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcgugcug uacuucuggg gcgugcacca ccccccgug 600

accaccgagc aggacgcccu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcgugcug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga caacaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacagagaga gcacccagaa ggccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgcc ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugaa gagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca gaaggagagc agacugaaca gacagagaau cgagagcgug 1560

aagcuggaga acuucgacgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cugguggugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcauga ucugcaucug a 1701

<210> 171175
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHJ57920

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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcaccaucg agggcuggau ccugggcaac 240

cccuggugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagaccaag agcagcgagu accccgugau caagggcacc 540

uucaacaaca ccggcgacaa gagcgugcug uacuucuggg gcgugcacca ccccccccagc 600

agaaacgagc agaacgugcu guacggcagc ggcgacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcagaggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccgccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac gagaacagcc agggcagcgg cuacgccgcc 1140

gacagagaga gcacccagaa ggccaccgac ggcaucacca acaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agagagugaa gagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

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uacgacuacc ccaaguacca gaaggagagc agacugaaca gacagaagau cgagagcgug 1560

agacuggaga acuucgacgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171176
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHJ57932

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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcagaauc 180

agcaacaagg ccccccugga ccugaaggag ugcacccugg agggcuggau ccugggcaac 240

ccccagugcg accugcugcu gggcgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gagagcccug 360

aucggcagcg gcgagggcgu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagaggcgu gaccagcagc ugccccuucg gcagcggcag cagcuucuac 480

agaaaccugc uguggaucgu gaagcacacc accagcagcu accccgugau caagggcacc 540

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accaacgagc agaacgugcu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagagg ccccgaggug gccgccagac ccguggugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa caucgagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag gacugcgacg ccaccugcca gaccaucgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcga gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agagagugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugag aaacggcacc 1500

uacaacuacc ccaaguacca ggccgagagc agacugaaca agcagagaau cgagagcgug 1560

aagcuggaga acuucgacgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau ccuggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171177
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57943

<400> 171177
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cuggaccggc 420

guggacaccg agagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

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agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

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aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca gaaggagagc agacugaaca gacagaagau cgagagcgug 1560

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cuggugcugg ugggccugau ccuggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171178
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57954

<400> 171178
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcauc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

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agcaugaacu ucgccagaaa ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

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aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

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ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca ggccgagagc agacugaaca gacagaagau cgagagcgug 1560

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cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171179
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57965

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accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugaaggag ugcacccugg agggcuggau ccugggcaac 240

ccccagugcg accugcugcu gggcgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gaccagcagc ugcagcuucg gcagcggcag cagcuucuac 480

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agcaugaacu ucgccagaag ccccgagauc gccgccagac ccguggugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa caucgagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaucgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

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aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agagagugag aagccagcug agagacaacg ccaacgacgg cggcaacggc 1440

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uacgacuacc ccaaguacca ggccgagagc agaagcaaca gacagagaau cgagagcgug 1560

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cugguggugg uguggcugau ccuggccaug ggccugugga ugugcgccaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171180
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57977

<400> 171180
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accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcaccaucg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

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agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca gaaggagagc agacugaaca gacagaagau cgagagcgug 1560

aagcuggaga acuucgacgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau ccuggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171181
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ57989

<400> 171181
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccaga 420

guggacaccg acagaggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucgu gaagcacacc accagcgagu accccgugau caagggcacc 540

uacaccaaca ccggcgacaa gagcgugcug uacuucuggg gcgugcacca ccccccgac 600

accaccgagc agaacgugcu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc ccauguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac gagaacagcc agggcagcgg cuacgccgcc 1140

gacagagaga gcacccagaa ggccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacag caacgugaag 1380

aaccugcacg agagagugaa gagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacaacuacc ccaaguacca ggccgagagc agacugaaca gacagaagau cgagagcgug 1560

aagcuggagg aguucggcgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171182
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ58001

<400> 171182
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcauc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacaccg acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcauccug uacuucuggg gcgugcacca ccccccgug 600

accaccgagc aggaggcccu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc ccauguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac gagaacagcc agggcagcgg cuacgccgcc 1140

gacagagaga gcacccagaa ggccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca gaccgagagc agacugaaca gacagaagau cgagagcgug 1560

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cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171183
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ58013

<400> 171183
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcagcaagg ccccccugga ccugagagac ugcagccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcgagggccc cagcuucuac 480

agaaaccugc uguggaucau caagagaacc accagcgagu accccgugau caagggcacc 540

uacagaaaca ccggcgacaa gagcgugcug uacuucuggg gcgugcacca ccccccgac 600

accaccgagc agaacgugcu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugga cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga gagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac gagaacagcc agggcagcgg cuacgccgcc 1140

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcacccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agagagugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacaacuacc ccaaguacca ggccgagagc agacugaaca agcagaagau cgagagcgug 1560

aagcuggagg aguucggcgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171184
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHJ58025

<400> 171184
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcaccaucg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagggcgu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcgugcug uacuucuggg gcgugcacca ccccccgug 600

accaccgagc agaacgaccu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaaa ccccgagauc gcccugagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcagccu gcccaucgag aacugcgacg ccaccugcca gaccgccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacagagaga gcacccagaa ggccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gacaagauga acacccaguu cgaggccgug gaccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugaa gagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

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uacaacuacc ccaaguacca gaaggagagc agacugaaca gacagaagau cgagagcgug 1560

aagcuggaga acuucgacgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171185
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ58037

<400> 171185
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugaaggag ugcacccugg agggcuggau ccugggcaac 240

ccccagugcg accugcugcu gggcgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg uggaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca acagcggcgu gaccagaagc ugccccuucg gcagcggcag cagcuucuac 480

agaaaccugc uguggaucau caagcacacc accagcagcu accccgugau caagggcacc 540

uucagaaaca ccggcgacaa gagcgugcug uacuucuggg gcgugcacca ccccaucgac 600

accaccgagc agaacgugcu guacggcagc ggcaacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccguggugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa caucgagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaucgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcga gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agagagugaa gagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca ggccgagagc agacugaaca agcagagaau cgagagcgug 1560

aagcuggaga acuucgacgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau cauggccauc ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171186
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHJ58049

<400> 171186
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcauc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacaccg acagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

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agcaugaacu ucgccagaac ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcgacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca ggccgagagc agacugaaca gacagaagau cgagagcgug 1560

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cuggugcugg ugggccugau cauggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171187
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ58061

<400> 171187
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cuggaccggc 420

guggacaccg agagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcauccug uacuucuggg gcgugcacca ccccccgug 600

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agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca gaaggagagc agacugaaca gacagaagau cgagagcgug 1560

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cuggugcugg ugggccugau ccuggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171188
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHJ58084

<400> 171188
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aucggcuacc acgccaacaa cagcaccacc aagguggaca ccauccugga gaagaacgug 120

accgugaccc acagcgugga gcugcuggag aaccagaagg aggagagauu cugcaagauc 180

agcaacaagg ccccccugga ccugagagac ugcacccugg agggcuggau ccugggcaac 240

cccagaugcg gcauccugcu ggccgaccag agcuggagcu acaucgugga gagacccaac 300

gccagaaacg gcaucugcua ccccggcacc cugaacgagg ccgaggagcu gaaggcccug 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cuggaccggc 420

gugaacaccg agagcggcgu gagcagcgcc ugcccccugg gcaacggccc cagcuucuac 480

agaaaccugc uguggaucau caagcugaag agcagcgagu accccgugau cagaggcacc 540

uucaacaaca ccggcgacaa gagcauccug uacuucuggg gcgugcacca ccccccgug 600

accaccgagc agaacgcccu guacggcagc ggcgacagau acgugagaau gggcaccgag 660

agcaugaacu ucgccagaag ccccgagauc gccgccagac ccgccgugaa cggccagaga 720

ggcagaaucg acuacuucug gagcauccug aagcccggcg agacccugaa cguggagagc 780

aacggcaacc ugaucgcccc cugguacgcc uacagauucg ugaacaagga cagcaagggc 840

gccaucuuca gaagcaaccu gcccaucgag aacugcgacg ccaccugcca gaccaccgag 900

ggcgugauca gaaccaacaa gaccuuccag aacgugagcc cccuguggau cggcgagugc 960

cccaaguacg ugaagagcaa gagccugaga cuggccaccg gccugagaaa cgugccccag 1020

aucgagacca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gacaagauga acacccaguu cgaggccgug ggccacgagu ucagcaaccu ggagagaaga 1260

aucgacaacc ugaacaagag aauggaggac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacc ugcacgacgc caacgugaag 1380

aaccugcacg agaaggugag aagccagcug agagacaacg ccaacgaccu gggcaacggc 1440

ugcuucgagu ucuggcacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacca gaaggagagc agacugaaca gacagaagau cgagagcgug 1560

aagcuggaga acuucgacgu guaccagauc cuggccaucu acagcaccgu gagcagcagc 1620

cuggugcugg ugggccugau ccuggccaug ggccugugga ugugcagcaa cggcagcaug 1680

cagugcagaa ucugcaucug a 1701

<210> 171189
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL80708

<400> 171189
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171190
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80718

<400> 171190
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagau cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171191
<211> 1710
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80729

<400> 171191

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc gagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gaccagccug cccuuccaga acgugcaccc caucaccauc 960

ggcaagugcc ccaaguacgu gaagagcacc aagcugagac uggccaccgg ccugagaaac 1020

gugcccagca uccagagcag aggccuguuc ggcgccaucg ccggcuucau cgagggcggc 1080

uggaccggca ugguggacgg cugguacggc uaccaccacc agaacgagca gggcagcggc 1140

uacgccgccg accugaagag cacccagaac gccaucgacg agaucaccaa caaggugaac 1200

agcgugaucg agaagaugaa cacccaguuc accgccgugg gcaaggaguu caaccaccug 1260

gagaagagaa ucgagaaccu gaacaagaag guggacgacg gcuuccugga caucuggacc 1320

uacaacgccg agcugcuggu gcugcuggag aacgagagaa cccuggacua ccacgacagc 1380

aacgugaaga accuguacga gaaggugaga agccagcuga agaacaacgc caaggagauc 1440

ggcaacggcu gcuucgaguu cuaccacaag ugcgacaaca ccugcaugga gagcgugaag 1500

aacggcaccu acgacuaccc caaguacagc gaggaggcca agcugaacag agaggagauc 1560

gacggcguga agcuggagag caccagaauc uaccagaucc uggccaucua cagcaccgug 1620

gccagcagcc uggugcuggu ggugagccug ggcgccauca gcuucuggau gugcagcaac 1680

ggcagccugc agugcagaau cugcaucuga 1710

<210> 171192
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80740

<400> 171192
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcgugca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171193
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80751

<400> 171193
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccauccu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagaagaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171194
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80762

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggauccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aaggacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171195
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80784

<400> 171195
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171196
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80795

<400> 171196
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171197
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80817

<400> 171197
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aacugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggaggccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171198
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80828

<400> 171198
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aacugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggaggccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171199
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80839

<400> 171199
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaga 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171200
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80861

<400> 171200
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucggcaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171201
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80872

<400> 171201
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaacgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171202
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL80883

<400> 171202
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171203
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80894

<400> 171203
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171204
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL80905

<400> 171204
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171205
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL80916

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171206
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171207
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171208
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagau cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171209
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171209

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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agaugcaaca ucugcaucug a 1701

<210> 171210
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL81013

<400> 171210
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 171211
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL81025

<400> 171211
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171212
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL81037

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171213
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL81049

<400> 171213
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171214
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL81061

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagau cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171215
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL81072

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagau cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171216
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL81083

<400> 171216
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171217
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL81095

<400> 171217
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171218
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81118

<400> 171218
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac caacagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 171219
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81129

<400> 171219
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171220
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<212> RNA
<213> Artificial Sequence

<220>
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<400> 171220
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171221
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL81153

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171222
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagcg ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171223
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHL81177

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagcg ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171224
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL81189

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171225
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL81212

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171226
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81224

<400> 171226
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaac cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 171227
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81235

<400> 171227

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171228
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL81247

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171229
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81259

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171230
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL81271

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171231
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81283

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171232
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81295

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171233
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81307

<400> 171233
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagau cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171234
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81329

<400> 171234
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171235
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81340

<400> 171235
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aggcagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgccauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca agagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171236
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81352

<400> 171236
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171237
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81364

<400> 171237
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcgccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac caacagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171238
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL81386

<400> 171238
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac caacagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgugaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171239
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81397

<400> 171239
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171240
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81409

<400> 171240
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171241
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81419

<400> 171241
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcaucacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171242
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL81430

<400> 171242
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171243
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL88951

<400> 171243
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171244
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89030

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171245
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89042

<400> 171245

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gguggggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171246
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89054

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caugagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171247
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89066

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171248
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89078

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ggcgacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

guggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171249
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89090

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171250
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89102

<400> 171250
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171251
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89114

<400> 171251
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171252
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89126

<400> 171252
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171253
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89138

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171254
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89150

<400> 171254
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugguguuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171255
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89162

<400> 171255
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccacc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171256
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL89174

<400> 171256
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171257
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89210

<400> 171257
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171258
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89222

<400> 171258
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171259
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89234

<400> 171259
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau gggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171260
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89246

<400> 171260
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcggc aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171261
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL89258

<400> 171261
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccaggcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171262
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89270

<400> 171262
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171263
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89282

<400> 171263

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171264
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89294

<400> 171264
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171265
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89306

<400> 171265
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171266
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89318

<400> 171266
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171267
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89330

<400> 171267
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171268
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89342

<400> 171268
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171269
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89354

<400> 171269
augaagacca ucaucgcccu gagcuacauc aucugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucagaaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171270
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89366

<400> 171270
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171271
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89378

<400> 171271
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171272
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89390

<400> 171272
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171273
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89402

<400> 171273
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171274
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL89414

<400> 171274
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171275
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89426

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccuguuc 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171276
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89438

<400> 171276
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171277
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89450

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171278
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89462

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171279
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89474

<400> 171279
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171280
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89486

<400> 171280
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171281
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89498

<400> 171281

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171282
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89510

<400> 171282
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171283
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89522

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171284
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89534

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171285
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89546

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagagcgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agagaaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171286
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89558

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauucgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171287
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89570

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauucgcc uucgcccuga gcagaggcuu cggcagcggc 840

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171288
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89582

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171289
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89594

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171290
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89606

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aacggcaacc ugaucgcccc cagauucgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauucgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171294
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<212> RNA
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hemagglutinin__InfluenzaA__AHL89654

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc aacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171296
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89678

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

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aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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gacuacccca aguacagcga ggagagcaag cugaacagaa agaagaucga cggcgugaag 1560

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<210> 171297
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<212> RNA
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hemagglutinin__InfluenzaA__AHL89690

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

gaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

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aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc aacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<400> 171299

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 171303
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 171304
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<212> RNA
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<220>
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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc aacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 171305
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

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uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauucgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgcccc cauggacgag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171306
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89810

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauucgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgcccc caugggcgag ugcgacgccg agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171307
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89822

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauucgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171308
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89834

<400> 171308
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc aacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg cgacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171309
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89846

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaccccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcagaagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171310
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171310
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171311
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89870

<400> 171311
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171312
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89882

<400> 171312
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171313
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89894

<400> 171313
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171314
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugagaca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171315
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaccuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171316
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc agcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau gggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171317
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89942

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171318
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89954

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

cacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171319
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89966

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171320
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL89978

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171321
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL89990

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gguguuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171322
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90002

<400> 171322
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ggcaucgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau gggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171323
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90014

<400> 171323
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccaggug gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171324
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90026

<400> 171324
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccaggug gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171325
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90050

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cgccgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171326
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90062

<400> 171326
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacua caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171327
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90074

<400> 171327
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171328
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL90086

<400> 171328
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagauacaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171329
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90098

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcgac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171330
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90110

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcguga ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171331
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90122

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggccu gggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171332
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90133

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171333
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90145

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggccu gggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171334
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90157

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagau ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccaucgc cagcagccug 1620

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<210> 171335
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90169

<400> 171335

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171336
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL90181

<400> 171336
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccaaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171337
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90217

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171338
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHL90229

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171339
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90241

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gauccccaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171340
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90253

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggg cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggugagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171341
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90265

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171342
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90277

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171343
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90289

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171344
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90301

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccagag acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171345
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90325

<400> 171345
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagauggg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 171346
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagauggg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171347
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90349

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171348
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90361

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171349
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90373

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171350
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90385

<400> 171350
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcagaa ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171351
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL90397

<400> 171351
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca gcagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171352
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90410

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171353
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90422

<400> 171353

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

agcaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacaccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171354
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90434

<400> 171354
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171355
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90446

<400> 171355
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171356
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90458

<400> 171356
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

gcccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171357
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90470

<400> 171357
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171358
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90482

<400> 171358
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171359
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90494

<400> 171359
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaacugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171360
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90506

<400> 171360
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaacugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171361
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90518

<400> 171361
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa ggagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171362
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90530

<400> 171362
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171363
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90542

<400> 171363
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171364
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL90554

<400> 171364
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171365
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90566

<400> 171365
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171366
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL90578

<400> 171366
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171367
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90590

<400> 171367
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaacugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171368
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90602

<400> 171368
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171369
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171369
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171370
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90638

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcagaaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171371
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90650

<400> 171371

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaccuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171372
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90662

<400> 171372
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171373
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90674

<400> 171373
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgugugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171374
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90686

<400> 171374
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggccau ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171375
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90698

<400> 171375
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171376
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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccgac 600

aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 171378
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171379
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHL90758

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171380
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHL90770

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccagc 600

aucaacgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

caccacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171381
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHL90782

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171382
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaacacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171383
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90806

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcuga ucagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171384
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90818

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccgac 600

aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171385
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90830

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccgac 600

aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171386
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90842

<400> 171386
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171387
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90854

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171388
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90866

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 171389
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90878

<400> 171389

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

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aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 171390
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL90890

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagaagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccgac 600

aucggcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90902

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHL90914

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171393
<211> 1698

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHL90938

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171394
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171395
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL90962

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171396
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHL90974

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucagcgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171397
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL90986

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171398
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL91010

<400> 171398
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccagc 600

aucaacgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug accaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171399
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL91022

<400> 171399
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga cagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccagc 600

aucaacgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaca gcaacgcccc cauggacaag ugcgacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug accaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 171400
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL91034

<400> 171400
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171401
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL91046

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga gauucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171402
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL91058

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggccau ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171403
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL91070

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ggcaacgaca acagcauggc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171404
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL91082

<400> 171404
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccaucu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171405
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL91094

<400> 171405
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaag 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171406
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL91106

<400> 171406
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca agggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171407
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcaagcu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc uggugacccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171408
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL91130

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171409
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171410
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL91154

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171411
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL91166

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171412
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL94984

<400> 171412
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171413
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL94996

<400> 171413
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171414
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95008

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171415
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95020

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171416
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95032

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171417
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95044

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171418
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL95056

<400> 171418
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171419
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95068

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171420
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95080

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171421
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95092

<400> 171421
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171422
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95104

<400> 171422
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaugag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171423
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95116

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ggcaacgacg acagcaccgc cacccugugc cugggccacu acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccaagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171424
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95128

<400> 171424
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171425
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95140

<400> 171425

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171426
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95152

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171427
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95164

<400> 171427
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171428
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95176

<400> 171428
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171429
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95188

<400> 171429
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171430
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95200

<400> 171430
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171431
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95212

<400> 171431
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171432
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95224

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171433
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95236

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171434
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95248

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171435
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL95260

<400> 171435
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucagcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171436
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL95272

<400> 171436
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171437
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95284

<400> 171437
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171438
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95296

<400> 171438
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aaggacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171439
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95307

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171440
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95319

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171441
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL95331

<400> 171441
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ggcgacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171442
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95343

<400> 171442
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucagaggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171443
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95432

<400> 171443

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171444
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL95444

<400> 171444
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171445
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95457

<400> 171445
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171446
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95470

<400> 171446
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugaa gcagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga gacccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171447
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95482

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171448
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95494

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171449
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95506

<400> 171449
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugagaa ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171450
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95518

<400> 171450
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171451
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95530

<400> 171451
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171452
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95542

<400> 171452
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171453
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95554

<400> 171453
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ggcaacgaca acagcauggc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171454
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171455
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171456
<211> 1701
<212> RNA
<213> Artificial Sequence

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171457
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171458
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95614

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 171459
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95626

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 171460
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95638

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171461
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95650

<400> 171461

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171462
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95662

<400> 171462
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc uggugacccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171463
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95686

<400> 171463
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171464
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95698

<400> 171464
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171465
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95710

<400> 171465
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171466
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL95722

<400> 171466
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucagaggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171467
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95734

<400> 171467
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171468
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95746

<400> 171468
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171469
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95758

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171470
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95770

<400> 171470
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171471
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95782

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171472
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL95794

<400> 171472
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaaa caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171473
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95806

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcagc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171474
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95818

<400> 171474
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171475
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95830

<400> 171475
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171476
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95842

<400> 171476
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171477
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL95854

<400> 171477
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171478
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95866

<400> 171478
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171479
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL95878

<400> 171479

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugagcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171480
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL95889

<400> 171480
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171481
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95901

<400> 171481
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171482
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95913

<400> 171482
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171483
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95937

<400> 171483
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ccgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171484
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95949

<400> 171484
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacaugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171485
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95961

<400> 171485
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171486
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95973

<400> 171486
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171487
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95985

<400> 171487
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171488
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL95997

<400> 171488
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaag 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171489
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96021

<400> 171489
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaag 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171490
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL96033

<400> 171490
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171491
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96045

<400> 171491
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171492
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96056

<400> 171492
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171493
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96068

<400> 171493
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171494
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96080

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171495
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171495
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171496
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96104

<400> 171496
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171497
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96116

<400> 171497

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacaccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171498
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL96128

<400> 171498
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171499
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96152

<400> 171499
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171500
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96164

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caagaacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171501
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171502
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96188

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171503
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96200

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccagg ugcuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171504
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96212

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171505
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96224

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171506
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96236

<400> 171506
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ugggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caagaacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171507
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96248

<400> 171507
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171508
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171509
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171510
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96304

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171511
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96318

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171512
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96330

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171513
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171514
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96354

<400> 171514
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171515
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96366

<400> 171515

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171516
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<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171517
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171518
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacaagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171519
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96414

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171520
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96426

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171521
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96438

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca gcagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171522
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96450

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171523
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96462

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171524
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96474

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugagcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171525
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96485

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171526
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171526
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171527
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96509

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171528
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96521

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171529
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96533

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171530
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96545

<400> 171530
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171531
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL96569

<400> 171531
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171532
<211> 1701
<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugagcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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<210> 171533
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<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171534
<211> 1701
<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171535
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171536
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96628

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171537
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96640

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 171538
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96652

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171539
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96664

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171540
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaucga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171541
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96688

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171542
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96700

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171543
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96712

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171544
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL96724

<400> 171544
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171545
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96748

<400> 171545
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171546
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96784

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171547
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96796

<400> 171547
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171548
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96808

<400> 171548
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171549
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL96820

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171550
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96832

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171551
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96844

<400> 171551

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171552
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96856

<400> 171552
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171553
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96868

<400> 171553
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cggcaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccguggug cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caugagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171554
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96880

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171555
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96892

<400> 171555
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agagugcagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171556
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96904

<400> 171556
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcaug 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccguggug cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caugagcugc 1620

uuccugcugu gcguggcccu gcugggcagc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171557
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96916

<400> 171557
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171558
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96928

<400> 171558
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171559
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96940

<400> 171559
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171560
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96952

<400> 171560
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171561
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL96964

<400> 171561
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171562
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL96976

<400> 171562
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171563
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL96988

<400> 171563
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga gacccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171564
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97000

<400> 171564
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171565
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97012

<400> 171565
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171566
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97024

<400> 171566
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaugaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171567
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL97036

<400> 171567
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacaccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171568
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97048

<400> 171568
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171569
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97060

<400> 171569

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgagc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171570
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97072

<400> 171570
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171571
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97084

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171572
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97096

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171573
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171574
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97120

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagagugac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau caucaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171575
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97132

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171576
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97144

<400> 171576
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 171577
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97156

<400> 171577
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171578
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97168

<400> 171578
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171579
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171579
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171580
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171580
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171581
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97204

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171582
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97216

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171583
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97228

<400> 171583
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

guggugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171584
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97240

<400> 171584
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171585
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL97252

<400> 171585
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171586
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97264

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171587
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97276

<400> 171587

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171588
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97288

<400> 171588
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagau caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171589
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97300

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171590
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97312

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171591
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97336

<400> 171591
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171592
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97348

<400> 171592
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171593
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97372

<400> 171593
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171594
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97384

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171595
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97396

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171596
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97408

<400> 171596
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171597
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97420

<400> 171597
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaugaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171598
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL97444

<400> 171598
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171599
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97456

<400> 171599
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171600
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97468

<400> 171600
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171601
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97480

<400> 171601
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171602
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<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171603
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaugaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171604
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHL97517

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcacccaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171605
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171605

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171606
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97541

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171607
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97553

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 171608
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97565

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171609
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97577

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agcccggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171610
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97589

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171612
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<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171613
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171614
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHL97637

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171615
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97661

<400> 171615
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 171616
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL97673

<400> 171616
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171617
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97685

<400> 171617
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171618
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171619
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171620
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171621
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171622
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97745

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 171623
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97757

<400> 171623

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171624
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97769

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171625
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97781

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaac 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171626
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171626
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171627
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97805

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaacu acgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171628
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171629
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97829

<400> 171629
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171630
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97841

<400> 171630
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171631
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97853

<400> 171631
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171632
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97865

<400> 171632
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171633
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97877

<400> 171633
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171634
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL97889

<400> 171634
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171635
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97901

<400> 171635
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171636
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97913

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171637
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97925

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcug cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171638
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97937

<400> 171638
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171639
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL97949

<400> 171639
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171640
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL97961

<400> 171640
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171641
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97973

<400> 171641

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171642
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171642
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171643
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL97997

<400> 171643
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucagaggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171644
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98009

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171645
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98021

<400> 171645
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcaagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaugg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171646
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL98033

<400> 171646
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171647
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98045

<400> 171647
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171648
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98057

<400> 171648
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171649
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98069

<400> 171649
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171650
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98081

<400> 171650
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcacccaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

gugggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171651
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98093

<400> 171651
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171652
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL98105

<400> 171652
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcgcc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171653
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98116

<400> 171653
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171654
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98128

<400> 171654
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171655
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98140

<400> 171655
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171656
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98152

<400> 171656
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171657
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL98164

<400> 171657
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171658
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171658
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171659
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171659

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171660
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98200

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171661
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98212

<400> 171661
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171662
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98224

<400> 171662
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171663
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98236

<400> 171663
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171664
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98248

<400> 171664
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171665
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98260

<400> 171665
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171666
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98272

<400> 171666
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171667
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98284

<400> 171667
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugagcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171668
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98295

<400> 171668
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171669
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98307

<400> 171669
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaugaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171670
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL98319

<400> 171670
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171671
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98331

<400> 171671
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171672
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98343

<400> 171672
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171673
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98354

<400> 171673
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaugaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171674
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98366

<400> 171674
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171675
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL98378

<400> 171675
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171676
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98390

<400> 171676
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171677
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98402

<400> 171677

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171678
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98414

<400> 171678
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171679
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98426

<400> 171679
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca ggugaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171680
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98438

<400> 171680
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171681
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98449

<400> 171681
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171682
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98471

<400> 171682
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagagag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171683
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98482

<400> 171683
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171684
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98494

<400> 171684
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171685
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98506

<400> 171685
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171686
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98518

<400> 171686
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171687
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98530

<400> 171687
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171688
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL98542

<400> 171688
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171689
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98554

<400> 171689
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171690
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98566

<400> 171690
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171691
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98578

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171692
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98590

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171693
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL98602

<400> 171693
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171694
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98614

<400> 171694
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171695
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98626

<400> 171695

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagagaugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171696
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98638

<400> 171696
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171697
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98650

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171698
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98662

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

auggugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171699
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98674

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaugaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171700
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98686

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171701
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98699

<400> 171701
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 171702
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98711

<400> 171702
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171703
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98722

<400> 171703
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171704
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98734

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171705
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171706
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171707
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171708
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98782

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171709
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98794

<400> 171709
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca gaagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171710
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98806

<400> 171710
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca gaccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171711
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171712
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171713
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171713

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171714
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171715
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98878

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171716
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98890

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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<210> 171717
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98902

<400> 171717
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 171718
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98913

<400> 171718
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171719
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98925

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171720
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98937

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171721
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98961

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171722
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL98973

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccguggug cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caugagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171723
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL98985

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

accaucaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171724
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL98997

<400> 171724
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171725
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99009

<400> 171725
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171726
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99021

<400> 171726
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171727
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcccc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171728
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99057

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga ucaucgacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171729
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cacccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171730
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99081

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gggcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171731
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99093

<400> 171731

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

aagugcaaca ucugcaucug a 1701

<210> 171732
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99117

<400> 171732
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 171733
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99129

<400> 171733
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg acaucgagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaucuggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171734
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99141

<400> 171734
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccugg acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171735
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99153

<400> 171735
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugacc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171736
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99165

<400> 171736
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171737
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99177

<400> 171737
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacaccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171738
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99189

<400> 171738
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171739
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99225

<400> 171739
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171740
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99237

<400> 171740
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171741
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99249

<400> 171741
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171742
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL99261

<400> 171742
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171743
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171744
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99285

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171745
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171746
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99309

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171747
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL99321

<400> 171747
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171748
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99333

<400> 171748
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171749
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99356

<400> 171749

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171750
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL99367

<400> 171750
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171751
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99379

<400> 171751
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171752
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99390

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171753
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99402

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171754
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99426

<400> 171754
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauga ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171755
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99438

<400> 171755
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171756
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99450

<400> 171756
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171757
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99462

<400> 171757
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171758
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99474

<400> 171758
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171759
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99486

<400> 171759
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171760
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL99498

<400> 171760
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171761
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99510

<400> 171761
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171762
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99522

<400> 171762
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171763
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99534

<400> 171763
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171764
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99546

<400> 171764
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171765
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99558

<400> 171765
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171766
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99570

<400> 171766
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcagcugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acaucaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171767
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99582

<400> 171767

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171768
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL99594

<400> 171768
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccagagccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171769
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99605

<400> 171769
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171770
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99617

<400> 171770
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171771
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99629

<400> 171771
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171772
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99641

<400> 171772
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccguggug cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caugagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171773
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99665

<400> 171773
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acaucaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171774
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171775
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171776
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99701

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugacc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171777
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99713

<400> 171777
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacaccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucaccugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171778
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL99725

<400> 171778
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171779
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99737

<400> 171779
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171780
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99748

<400> 171780
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171781
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99760

<400> 171781
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171782
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171783
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171784
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99796

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171785
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99808

<400> 171785

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171786
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99820

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgacggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171787
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99832

<400> 171787
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171788
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99844

<400> 171788
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 171789
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99856

<400> 171789
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171790
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99868

<400> 171790
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171791
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99880

<400> 171791
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171792
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99892

<400> 171792
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171793
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99904

<400> 171793
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171794
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99916

<400> 171794
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaugag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171795
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHL99928

<400> 171795
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171796
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHL99940

<400> 171796
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcgg cguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171797
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171797
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171798
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171798
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171799
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99976

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171800
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHL99988

<400> 171800
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171801
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171802
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00013

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 171803
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00025

<400> 171803

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171804
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00037

<400> 171804
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171805
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00061

<400> 171805
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171806
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00073

<400> 171806
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171807
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00085

<400> 171807
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171808
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00097

<400> 171808
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaac 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac caccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171809
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00108

<400> 171809
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171810
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00120

<400> 171810
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171811
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00132

<400> 171811
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171812
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00144

<400> 171812
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171813
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00156

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171814
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171814
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171815
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00180

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacaac ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171816
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00192

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171817
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00204

<400> 171817
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171818
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00216

<400> 171818
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171819
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00228

<400> 171819
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171820
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00240

<400> 171820
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171821
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171821

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171822
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 171822
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171823
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171824
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00288

<400> 171824
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171825
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00300

<400> 171825
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171826
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00312

<400> 171826
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 171827
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00324

<400> 171827
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171828
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00336

<400> 171828
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171829
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00348

<400> 171829
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171830
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00360

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171831
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00372

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171832
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHM00395

<400> 171832
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171833
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00407

<400> 171833
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171834
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00419

<400> 171834
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171835
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00443

<400> 171835
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171836
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00455

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171837
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHM00467

<400> 171837
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171838
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00479

<400> 171838
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171839
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00491

<400> 171839

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171840
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00503

<400> 171840
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171841
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00515

<400> 171841
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171842
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00527

<400> 171842
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcccca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171843
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00539

<400> 171843
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171844
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00543

<400> 171844
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcacca uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171845
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00555

<400> 171845
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171846
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00567

<400> 171846
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171847
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00579

<400> 171847
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171848
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00591

<400> 171848
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171849
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00603

<400> 171849
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171850
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHM00615

<400> 171850
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171851
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00627

<400> 171851
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171852
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00639

<400> 171852
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 171853
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00651

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171854
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00663

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171855
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM00675

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171856
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00687

<400> 171856
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171857
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00698

<400> 171857

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaccag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171858
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00710

<400> 171858
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171859
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00722

<400> 171859
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171860
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00734

<400> 171860
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171861
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00746

<400> 171861
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171862
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00758

<400> 171862
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171863
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00770

<400> 171863
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171864
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00782

<400> 171864
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171865
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00794

<400> 171865
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171866
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00806

<400> 171866
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171867
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00818

<400> 171867
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171868
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHM00830

<400> 171868
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171869
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00842

<400> 171869
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171870
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00854

<400> 171870
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171871
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00866

<400> 171871
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171872
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00878

<400> 171872
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171873
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00890

<400> 171873
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171874
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00902

<400> 171874
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171875
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00914

<400> 171875

augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171876
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00926

<400> 171876
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171877
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00938

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171878
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00950

<400> 171878
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caugagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171879
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00962

<400> 171879
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171880
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM00974

<400> 171880
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcgg caucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171881
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM24224

<400> 171881
augaacaccc agauccuggu guucgcccug aucgccauca uccccaccaa cgccgacaag 60

aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaaggagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

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uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 171882
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM24236

<400> 171882
augaacaccc agauccuggu guucgcccug aucgccauca uccccaccaa cgccgacaag 60

aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 171883
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM24248

<400> 171883
augaacaccc agauccuggu guucgcccug aucgccauca uccccaccaa cgccgacaag 60

aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 171884
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98309

<400> 171884
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgaggugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171885
<211> 1710
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98339

<400> 171885
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gaccagccug cccuuccaga acauccaccc caucaccauc 960

ggcaagugcc ccaaguacgu gaagagcacc aagcugagac uggccaccgg ccugagaaac 1020

gugcccagca uccagagcag aggccuguuc ggcgccaucg ccggcuucau cgagggcggc 1080

uggaccggca ugguggacgg cugguacggc uaccaccacc agaacgagca gggcagcggc 1140

uacgccgccg accugaagag cacccagaac gccaucgaca agaucaccaa caaggugaac 1200

agcgugaucg agaagaugaa cacccaguuc accgccgugg gcaaggaguu caaccaccug 1260

gagaagagaa ucgagaaccu gaacaagaag guggacgacg gcuuccugga caucuggacc 1320

uacaacgccg agcugcuggu gcugcuggag aacgagagaa cccuggacua ccacgacagc 1380

aacgugaaga accuguacga gaaggugaga aaccagcuga agaacaacgc caaggagauc 1440

ggcaacggcu gcuucgaguu cuaccacaag ugcgacaaca ccugcaugga gagcgugaag 1500

aacggcaccu acgacuaccc caaguacagc gaggaggcca agcugaacag agaggagauc 1560

gacggcguga agcuggagag caccagaauc uaccagaucc uggccaucua cagcaccgug 1620

gccagcagcc uggugcuggu ggugagccug ggcgccauca gcuucuggau gugcagcaac 1680

ggcagccugc agugcagaau cugcaucuga 1710

<210> 171886
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHM98350

<400> 171886
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acgccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171887
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98361

<400> 171887
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171888
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98372

<400> 171888
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171889
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98383

<400> 171889
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171890
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98394

<400> 171890
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171891
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHM98405

<400> 171891
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171892
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98416

<400> 171892
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171893
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98427

<400> 171893

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171894
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98438

<400> 171894
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171895
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98449

<400> 171895
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171896
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98460

<400> 171896
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac caccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171897
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98471

<400> 171897
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171898
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98482

<400> 171898
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gacaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171899
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98493

<400> 171899
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaaguac 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171900
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98504

<400> 171900
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag caaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171901
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98515

<400> 171901
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171902
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98526

<400> 171902
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugagaa gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcuga uccugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171903
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98537

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171904
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHM98548

<400> 171904
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171905
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98559

<400> 171905
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171906
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98570

<400> 171906
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171907
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98581

<400> 171907
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agaagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171908
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98592

<400> 171908
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171909
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM98603

<400> 171909
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171910
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98614

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171911
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM98625

<400> 171911

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171912
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHM98636

<400> 171912
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171913
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98647

<400> 171913
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171914
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM98658

<400> 171914
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171915
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM98669

<400> 171915
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171916
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98701

<400> 171916
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171917
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98712

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171918
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98723

<400> 171918
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aacugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucc ugcccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccagauacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga ucgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171919
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM98734

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cagcaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171920
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98745

<400> 171920
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171921
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98756

<400> 171921
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gugaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171922
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHM98767

<400> 171922
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171923
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98778

<400> 171923
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacagaaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccagagccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171924
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98798

<400> 171924
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171925
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98809

<400> 171925
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171926
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98820

<400> 171926
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171927
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHM98831

<400> 171927
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171928
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98836

<400> 171928
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggauccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171929
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98847

<400> 171929

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171930
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM98858

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171931
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM98877

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171932
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM98898

<400> 171932
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171933
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM98909

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171934
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM98932

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugggcggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171935
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98940

<400> 171935
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugggcggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 171936
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98951

<400> 171936
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugggcggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 171937
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM98975

<400> 171937
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171938
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM98997

<400> 171938
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171939
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM99019

<400> 171939
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171940
<211> 1701
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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHM99031

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171941
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHM99043

<400> 171941
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171942
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM99054

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171943
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM99065

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171944
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHM99075

<400> 171944
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcgaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171945
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHN00717

<400> 171945
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugggcggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu guucaccgug agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacguga acaacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acagaaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaacagagg ccccggcagc 840

ggcaucauca ucagcgacgc ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcgugauc 1200

aagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug agaaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171946
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHN00764

<400> 171946
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugggcggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu guucaccgug agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacguga acaacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acagaaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca ugaacagagg ccccggcagc 840

ggcaucauca ucagcgacgc ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cauccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcgugauc 1200

aagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug agaaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171947
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHN96323

<400> 171947

augaacaccc agauccuggu guucgcccug aucgccauca uccccaccaa cgccgacaag 60

aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucggcauc 1680

uga 1683

<210> 171948
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHN96442

<400> 171948
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171949
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHN96443

<400> 171949
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacaccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171950
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHN96444

<400> 171950
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa ccagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171951
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHN96445

<400> 171951
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa ccagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171952
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHN96447

<400> 171952
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 171953
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83765

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaccaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171954
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83766

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171955
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83767

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171956
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83768

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg acagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171957
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83770

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171958
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83771

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171959
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83772

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171960
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83773

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171961
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83774

<400> 171961
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171962
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83775

<400> 171962
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171963
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83776

<400> 171963
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171964
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83777

<400> 171964
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc ugcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171965
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83778

<400> 171965

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccguguac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171966
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83779

<400> 171966
augaaggcca uccugguggu gcugcuguac accuucgcca ccaccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171967
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83780

<400> 171967
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagacag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171968
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83781

<400> 171968
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171969
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83782

<400> 171969
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171970
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83783

<400> 171970
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

aucaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagacag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171971
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83784

<400> 171971
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171972
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83785

<400> 171972
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171973
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83787

<400> 171973
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171974
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83788

<400> 171974
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugagcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucguga acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171975
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83789

<400> 171975
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171976
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83790

<400> 171976
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171977
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83791

<400> 171977
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171978
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83792

<400> 171978
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171979
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83793

<400> 171979
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171980
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83794

<400> 171980
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171981
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83795

<400> 171981
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcgccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171982
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83796

<400> 171982
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171983
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83798

<400> 171983

augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171984
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83799

<400> 171984
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171985
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83800

<400> 171985
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaag acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171986
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83801

<400> 171986
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171987
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83802

<400> 171987
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcaggg ccuguaccag aacguggacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171988
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83803

<400> 171988
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171989
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83804

<400> 171989
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171990
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83805

<400> 171990
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171991
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83806

<400> 171991
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171992
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83807

<400> 171992
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaaggac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171993
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83808

<400> 171993
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgagg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171994
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83809

<400> 171994
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171995
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83810

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171996
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83812

<400> 171996
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgaguacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171997
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83813

<400> 171997
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171998
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83814

<400> 171998
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga aaccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaccaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 171999
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83815

<400> 171999
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172000
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83816

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172001
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83817

<400> 172001

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accuggugug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172002
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83818

<400> 172002
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172003
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83819

<400> 172003
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172004
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83821

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugagcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucguga acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172005
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83822

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugagcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucguga acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172006
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83823

<400> 172006
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa caccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172007
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83824

<400> 172007
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagacag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga aaccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172008
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83825

<400> 172008
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172009
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83826

<400> 172009
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacuuca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172010
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83827

<400> 172010
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172011
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83828

<400> 172011
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172012
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83829

<400> 172012
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172013
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83830

<400> 172013
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172014
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83831

<400> 172014
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaucgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucaucg ugagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172015
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<212> RNA
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hemagglutinin__InfluenzaA__AHV83832

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172016
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHV83833

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172017
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83834

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172018
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83836

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagacag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172019
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHV83837

<400> 172019

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagacag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172020
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83838

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172021
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83839

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172022
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83840

<400> 172022
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172023
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83841

<400> 172023
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagacag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172024
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83842

<400> 172024
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172025
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83843

<400> 172025
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172026
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83844

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172027
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83845

<400> 172027
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172028
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83846

<400> 172028
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172029
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83847

<400> 172029
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172030
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83848

<400> 172030
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172031
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHV83849

<400> 172031
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaccaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172032
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83850

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaaggcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172033
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83851

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172034
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83852

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172035
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83853

<400> 172035
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagacccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aacccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172036
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83855

<400> 172036
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172037
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83856

<400> 172037

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agaucgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172038
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83857

<400> 172038
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172039
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83858

<400> 172039
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172040
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83859

<400> 172040
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172041
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83861

<400> 172041
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172042
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83862

<400> 172042
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172043
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83863

<400> 172043
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172044
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83864

<400> 172044
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172045
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83866

<400> 172045
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172046
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83867

<400> 172046
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172047
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83868

<400> 172047
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172048
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83869

<400> 172048
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac caacagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172049
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83870

<400> 172049
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172050
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83871

<400> 172050
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172051
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83872

<400> 172051
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172052
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83873

<400> 172052
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accguggccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172053
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83874

<400> 172053
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172054
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83875

<400> 172054
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172055
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83876

<400> 172055

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172056
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83877

<400> 172056
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172057
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83878

<400> 172057
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagacag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172058
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83879

<400> 172058
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagacag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172059
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83881

<400> 172059
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172060
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83882

<400> 172060
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172061
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83883

<400> 172061
augaaggcca uccugguggu gcugcuguac acccuggcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172062
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83884

<400> 172062
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172063
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83885

<400> 172063
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccguguac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172064
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83887

<400> 172064
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172065
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83888

<400> 172065
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172066
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83889

<400> 172066
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172067
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83890

<400> 172067
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172068
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83891

<400> 172068
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172069
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83893

<400> 172069
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172070
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83894

<400> 172070
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172071
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83895

<400> 172071
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagacc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172072
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83896

<400> 172072
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172073
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83897

<400> 172073

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172074
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83898

<400> 172074
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggugaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172075
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83899

<400> 172075
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172076
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83900

<400> 172076
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172077
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83901

<400> 172077
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172078
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83902

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172079
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83903

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172080
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83904

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172081
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83905

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172082
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83906

<400> 172082
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172083
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83907

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172084
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83908

<400> 172084
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagccccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caagaaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172085
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHV83911

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagccccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172086
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHV83912

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172087
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHV83913

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172088
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHV83915

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172089
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHV83916

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172090
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83917

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagccccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 172091
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83919

<400> 172091

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172092
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83920

<400> 172092
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172093
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83921

<400> 172093
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172094
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83922

<400> 172094
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucagccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172095
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83923

<400> 172095
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgaguacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172096
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83924

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172097
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83925

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgaguacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172098
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83926

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172099
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83927

<400> 172099
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagccccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172100
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83928

<400> 172100
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172101
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83929

<400> 172101
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172102
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83930

<400> 172102
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172103
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83931

<400> 172103
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172104
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83932

<400> 172104
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172105
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83933

<400> 172105
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugacccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggcccugu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172106
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83934

<400> 172106
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172107
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83935

<400> 172107
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172108
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHV83937

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172109
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83938

<400> 172109

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172110
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83939

<400> 172110
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172111
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83940

<400> 172111
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuucaugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacagagug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172112
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHV83941

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172113
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83943

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172114
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83944

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gugaccguga cccacagcgu gaaccugcug gaggacgagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172115
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83945

<400> 172115
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172116
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHV83947

<400> 172116
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucaccg ugaagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172117
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHV83948

<400> 172117
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172118
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83949

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172119
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83950

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172120
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHV83953

<400> 172120
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172121
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83954

<400> 172121
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172122
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHV83956

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugcag 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172123
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ13523

<400> 172123
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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa cgagaagugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caacgagggc 420

uucaacugga ccggcgugac ccagagcggc ggcagcuacg ccugcaagag aggcagcgug 480

aacagcuucu ucagcagacu gaacuggcug uacaagagcg agagcaagua ccccgugcug 540

aacgugacca ugcccaacaa cggcaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acaaggagca gaccaaccug uacgugagag ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaccugca gcuacgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 172124
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucguggacc agaagacccu guacagaacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172126
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<212> RNA
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<211> 1701
<212> RNA
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<400> 172127

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172128
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 172129
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 172130
<211> 1701
<212> RNA
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<220>
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172147
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ35902

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172148
<211> 1710
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ35913

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gaccagccug cccuuccaga acauccaccc caucaccauc 960

ggcaagugcc ccaaguacgu gaagagcacc aagcugagac uggccaccgg ccugagaaac 1020

gugcccagca uccagagcag aggccuguuc ggcgccaucg ccggcuucau cgagggcggc 1080

uggaccggca ugguggacgg cugguacggc uaccaccacc agaacgagca gggcagcggc 1140

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agcgugaucg agaagaugaa cacccaguuc accgccgugg gcaaggaguu caaccaccug 1260

gagaagagaa ucgagaaccu gaacaagaag guggacgacg gcuuccugga caucuggacc 1320

uacaacgccg agcugcuggu gcugcuggag aacgagagaa cccuggacua ccacgacagc 1380

aacgugaaga accuguacga gagagugaga aaccagcuga agaacaacgc caaggagauc 1440

ggcaacggcu gcuucgaguu cuaccacaag ugcgacaaca ccugcaugga gagcgugaag 1500

aacggcaccu acgacuaccc caaguacagc gaggaggcca agcugaacag agaggagauc 1560

gacggcguga agcuggagag caccagaauc uaccagaucc uggccaucua cagcaccgug 1620

gccagcagcc uggugcuggu ggugagccug ggcgccauca gcuucuggau gugcagcaac 1680

ggcagccugc agugcagaau cugcaucuga 1710

<210> 172149
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ35924

<400> 172149
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

acccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgccc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172150
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ35935

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cauccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172151
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ35946

<400> 172151
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172152
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ35958

<400> 172152
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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cagugcagaa ucugcaucug a 1701

<210> 172153
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ35980

<400> 172153
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172154
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ35991

<400> 172154
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172155
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36002

<400> 172155
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172156
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ36013

<400> 172156
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacagaaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172157
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36024

<400> 172157
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaac cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172158
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36035

<400> 172158
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcugauccag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172159
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36047

<400> 172159
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172160
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36059

<400> 172160
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172161
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ36070

<400> 172161
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaac cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172162
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36081

<400> 172162
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacagaaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172163
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36092

<400> 172163

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaac cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172164
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36103

<400> 172164
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172165
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36114

<400> 172165
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaac cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172166
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36125

<400> 172166
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172167
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36136

<400> 172167
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172168
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36147

<400> 172168
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172169
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36158

<400> 172169
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172170
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36169

<400> 172170
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172171
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36180

<400> 172171
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172172
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36191

<400> 172172
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172173
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36203

<400> 172173
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172174
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ36215

<400> 172174
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172175
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36226

<400> 172175
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172176
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36238

<400> 172176
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172177
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36249

<400> 172177
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__AHZ36260

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccuuc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172179
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHZ36271

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHZ36283

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 172181
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHZ36294

<400> 172181

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172182
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36306

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 172183
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36317

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 172184
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36328

<400> 172184
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172185
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36339

<400> 172185
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagagaaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172186
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36362

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcau caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagagaaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172187
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36385

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucaa gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172188
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucaa gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172189
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36409

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172190
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36433

<400> 172190
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172191
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36445

<400> 172191
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac gacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172192
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ36457

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172193
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36469

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 172194
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172198
<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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<220>
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<400> 172199

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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agaugcaaca ucugcaucug a 1701

<210> 172200
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<220>
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaugcaaca ucugcaucug a 1701

<210> 172201
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<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172202
<211> 1701
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172203
<211> 1701

<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172204
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172205
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caaggagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172206
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36625

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172207
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ36637

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172208
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36649

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172209
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36661

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172210
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 172210
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172211
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ36685

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagaga 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172212
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39698

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172213
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39722

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

gacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacga cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172214
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39734

<400> 172214
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

gacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacga cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172215
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39746

<400> 172215
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172216
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39758

<400> 172216
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

gacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacga cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172217
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ39770

<400> 172217

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

gacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacga cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172218
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ39782

<400> 172218
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

gacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacga cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucaac gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172219
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ39794

<400> 172219
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172220
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39806

<400> 172220
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172221
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39818

<400> 172221
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaccuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcuga ucguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172222
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39841

<400> 172222
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172223
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39853

<400> 172223
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172224
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39865

<400> 172224
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172225
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHZ39877

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172226
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ39889

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172227
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ39913

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172228
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172229
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39937

<400> 172229
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172230
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39949

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172231
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39961

<400> 172231
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172232
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ39973

<400> 172232
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaugcaaca ucugcaucug a 1701

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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<210> 172239
<211> 1701

<212> RNA
<213> Artificial Sequence

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<210> 172240
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40072

<400> 172240
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172241
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHZ40084

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172242
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172243
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172244
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHZ40120

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172245
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40130

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caagaacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172246
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ40142

<400> 172246
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga cagacccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172247
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40154

<400> 172247
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga caugcugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172248
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40166

<400> 172248
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcagaugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172249
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40177

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172250
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172251
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AHZ40201

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172252
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40213

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172253
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 172253

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaugcaaca ucugcaucug a 1701

<210> 172254
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHZ40237

<400> 172254
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaccga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172255
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40249

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga cagacccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172256
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40261

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172257
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40273

<400> 172257
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172258
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40285

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cacccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172259
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40297

<400> 172259
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172260
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40309

<400> 172260
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172261
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40321

<400> 172261
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172262
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40333

<400> 172262
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172263
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40345

<400> 172263
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccagcga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172264
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ40357

<400> 172264
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172265
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40369

<400> 172265
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaga 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172266
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40381

<400> 172266
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172267
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40393

<400> 172267
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172268
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40405

<400> 172268
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172269
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40417

<400> 172269
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172270
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40429

<400> 172270
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172271
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40441

<400> 172271

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172272
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40453

<400> 172272
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccgccggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172273
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40465

<400> 172273
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga caugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagagauuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172274
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40477

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcgac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gagcgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172275
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40489

<400> 172275
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172276
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40500

<400> 172276
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172277
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40512

<400> 172277
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172278
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40524

<400> 172278
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172279
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40536

<400> 172279
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172280
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40548

<400> 172280
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172281
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40572

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172282
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ40583

<400> 172282
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172283
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40595

<400> 172283
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172284
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40606

<400> 172284
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172285
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40618

<400> 172285
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172286
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40626

<400> 172286
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172287
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40638

<400> 172287
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172288
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40650

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172289
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 172289

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca uccccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172290
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40674

<400> 172290
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172291
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40686

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172292
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40698

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172293
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40710

<400> 172293
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172294
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40722

<400> 172294
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172295
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40734

<400> 172295
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga cagacccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172296
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172297
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<212> RNA
<213> Artificial Sequence

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga caugcugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcaac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172298
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<212> RNA
<213> Artificial Sequence

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172299
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172300
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172301
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40815

<400> 172301
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172302
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHZ40826

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag caucuaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172303
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40848

<400> 172303
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172304
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40881

<400> 172304
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172305
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ40892

<400> 172305
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172306
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40914

<400> 172306
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172307
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40925

<400> 172307

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172308
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40936

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172309
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40947

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172310
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ40958

<400> 172310
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172311
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40969

<400> 172311
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172312
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40980

<400> 172312
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172313
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ40991

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172314
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41002

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172315
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41013

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172316
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41024

<400> 172316
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172317
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41035

<400> 172317
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172318
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ41046

<400> 172318
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172319
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41057

<400> 172319
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172320
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41068

<400> 172320
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172321
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41079

<400> 172321
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172322
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41090

<400> 172322
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172323
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41101

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172324
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41112

<400> 172324
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172325
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41123

<400> 172325

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172326
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHZ41134

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172327
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHZ41145

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172328
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41156

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172329
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41167

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172330
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172331
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHZ41189

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172332
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41246

<400> 172332
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172333
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41263

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172334
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41281

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172335
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41292

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172336
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ41303

<400> 172336
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172337
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41314

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172338
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41325

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172339
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41336

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172340
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41347

<400> 172340
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172341
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ41358

<400> 172341
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172342
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41366

<400> 172342
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172343
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41377

<400> 172343

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172344
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41388

<400> 172344
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172345
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41410

<400> 172345
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172346
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41432

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172347
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41441

<400> 172347
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172348
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41452

<400> 172348
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172349
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41463

<400> 172349
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ugcaucggcu accacgccaa caacagcacc gacaccgugu acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172350
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41473

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

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uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172351
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41484

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172352
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41495

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172353
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41506

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172354
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ41517

<400> 172354
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcgag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172355
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41528

<400> 172355
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcgag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172356
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41539

<400> 172356
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172357
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41550

<400> 172357
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172358
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41561

<400> 172358
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172359
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41572

<400> 172359
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacgagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172360
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41583

<400> 172360
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172361
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41594

<400> 172361

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag gagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172362
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41605

<400> 172362
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaacac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gaugggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172363
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41616

<400> 172363
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172364
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41627

<400> 172364
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172365
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41638

<400> 172365
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172366
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41649

<400> 172366
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172367
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41660

<400> 172367
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172368
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41671

<400> 172368
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172369
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41682

<400> 172369
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172370
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41693

<400> 172370
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172371
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41704

<400> 172371
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172372
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ41715

<400> 172372
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172373
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41726

<400> 172373
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172374
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41737

<400> 172374
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172375
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ41748

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172376
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ41759

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg agcagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172377
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 172377
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg caccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172378
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42572

<400> 172378
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172379
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42584

<400> 172379

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172380
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42596

<400> 172380
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172381
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ42608

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172382
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AHZ42619

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172383
<211> 1701

<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AHZ42631

<400> 172383
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ggcaacuaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172384
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ42643

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcauc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172385
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ42654

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172386
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42666

<400> 172386
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172387
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42678

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172388
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42690

<400> 172388
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172389
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42701

<400> 172389
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172390
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ42713

<400> 172390
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172391
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42725

<400> 172391
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172392
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42737

<400> 172392
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccgagagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172393
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42748

<400> 172393
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172394
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42760

<400> 172394
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172395
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ42772

<400> 172395
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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaaggag 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172396
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ42784

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172397
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ42796

<400> 172397

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172398
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ42808

<400> 172398
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172399
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42820

<400> 172399
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccgagagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172400
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ42831

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172401
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ42843

<400> 172401
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172402
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42855

<400> 172402
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacaugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172403
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ42867

<400> 172403
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcgagua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172404
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172405
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ42891

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcagcugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172406
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ42903

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172407
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ42915

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ggcaacgacg acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172408
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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<400> 172408
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

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cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172409
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ59759

<400> 172409
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

agcagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172410
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ59771

<400> 172410
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172411
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ59795

<400> 172411
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcacca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

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uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172412
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ59807

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcacca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172413
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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<400> 172413
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcacca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172414
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ59831

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172415
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ59843

<400> 172415

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172416
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ59855

<400> 172416
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172417
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ59867

<400> 172417
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172418
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ59879

<400> 172418
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

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cccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172419
<211> 1683

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ59915

<400> 172419
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

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uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172420
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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<400> 172420
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

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agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172421
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ59939

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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aacuggacca gagacagcau caccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172422
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ59951

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

cccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172423
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ59963

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172424
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ59988

<400> 172424
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172425
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ60000

<400> 172425
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172426
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AHZ60012

<400> 172426
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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

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agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172427
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ60024

<400> 172427
augaacaccc agauccuggu guucgcccug aucgccauca uccccaccaa cgccgacaag 60

aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

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uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172428
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ60036

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcacca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172429
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ60048

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcacca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172430
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcacca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172431
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ60072

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcacca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172432
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHZ60084

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcacca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172433
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AHZ60096

<400> 172433

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacga cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

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cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

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uga 1683

<210> 172434
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC64889

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172435
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73738

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172436
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73739

<400> 172436
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaca cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172437
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73740

<400> 172437
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcuggaca gagagaagau cgacggcgug 1560

agacuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172438
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73741

<400> 172438
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca cagaugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucagaggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172439
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73742

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagacag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacagaaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172440
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73743

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagacag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacagaaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172441
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73744

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaaccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172442
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73745

<400> 172442
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cugggcccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172443
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73746

<400> 172443
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugacccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172444
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIC73747

<400> 172444
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa caccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172445
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73748

<400> 172445
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172446
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIC73749

<400> 172446
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagagaugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaca gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca ucaccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172447
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73750

<400> 172447
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172448
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73754

<400> 172448
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcagaaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172449
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIC73755

<400> 172449
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172450
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73756

<400> 172450
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172451
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73757

<400> 172451

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172452
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIC73758

<400> 172452
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172453
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73760

<400> 172453
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172454
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73761

<400> 172454
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172455
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73762

<400> 172455
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172456
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73763

<400> 172456
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172457
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73765

<400> 172457
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172458
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73766

<400> 172458
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172459
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73767

<400> 172459
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcugaucaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaagaucag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172460
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73768

<400> 172460
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172461
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73769

<400> 172461
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172462
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIC73770

<400> 172462
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172463
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73771

<400> 172463
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172464
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73772

<400> 172464
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172465
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73773

<400> 172465
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172466
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73775

<400> 172466
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172467
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIC73776

<400> 172467
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172468
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73777

<400> 172468
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172469
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73778

<400> 172469

augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172470
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73779

<400> 172470
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172471
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73780

<400> 172471
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172472
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73781

<400> 172472
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172473
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73782

<400> 172473
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172474
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73783

<400> 172474
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172475
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73784

<400> 172475
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172476
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73785

<400> 172476
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172477
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73786

<400> 172477
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172478
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73787

<400> 172478
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172479
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73788

<400> 172479
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172480
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIC73789

<400> 172480
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172481
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73790

<400> 172481
augaaggcca uccugguggu gcugcuguac accuucgcca ccaccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagacag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172482
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73791

<400> 172482
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ugcaucggcu accacgccaa caacagcacc gacaccaucg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172483
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73792

<400> 172483
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172484
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73793

<400> 172484
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172485
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIC73794

<400> 172485
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172486
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73796

<400> 172486
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172487
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73797

<400> 172487

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172488
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73798

<400> 172488
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172489
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73800

<400> 172489
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172490
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73801

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172491
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73802

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172492
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73803

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172493
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73804

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172494
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73805

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172495
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73806

<400> 172495
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172496
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73807

<400> 172496
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acaacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172497
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73808

<400> 172497
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172498
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagacag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacgaggug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172499
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73810

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacag augcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172500
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AIC73813

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg ugaucagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172501
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hemagglutinin__InfluenzaA__AIC73815

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172502
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73817

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172503
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172504
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73820

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacaucgag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172505
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AIC73821

<400> 172505

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172506
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73824

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172507
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73825

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172508
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73827

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagccccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cugauccugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172509
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AIC73828

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172510
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AIC73830

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172511
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73833

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172512
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73834

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgacgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg gccagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172513
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73835

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agccugugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172514
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73836

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172515
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73837

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172516
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga ccugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172517
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIC73839

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172518
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73840

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172519
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73841

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaucgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172520
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIC73842

<400> 172520
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

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gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

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cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

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agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AID70444

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu ggccaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg cagagaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcuucaa cggcagccug 1680

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<212> RNA
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hemagglutinin__InfluenzaA__AID70445

<400> 172523

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 172524
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AID70446

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcagg uggugagccu gggcgccauc agcuucugga ugugcuucaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172525
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AID70447

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagggc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcuucaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172526
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AID70448

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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 172527
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AID70449

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcgugug a 1701

<210> 172528
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AID70450

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gaccagcaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg uggugcugga gaacgagaga acccuggagu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa guucgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcagg uggugagccu gggcgccauc agcuucugga ugugcuucaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172529
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AID70451

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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ugcuucgagu ucuaccacaa guucgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 172530
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugggca gcgugagcag cuucaagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 172531
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 172532
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AID70454

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 172533
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AID70455

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugggcggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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cagugcagaa ucugcaucug a 1701

<210> 172534
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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<210> 172535
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AID70457

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa guucgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcagg uggugagccu gggcgccauc agcuucugga agugcuucaa cggcagccug 1680

cagugcagaa ucugcagcug a 1701

<210> 172536
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<212> RNA
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hemagglutinin__InfluenzaA__AID70458

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ggcaacgaca acagcauggc cacccugugc cugggccacc acgccgugcc caacggcacc 120

auggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcaacagc ccccaccaga uccuggacgg cggcaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagcau cguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc aagagcgcca gcugcaagag aggcagcgac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aaggugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccu acaacgacca gaucagccug uacgcccagg ccagcggcau caucaccgug 660

agcaccaaga gaaaccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau gggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaucgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

gacaagcugu ucgagagaac caagaagcag augagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgaca gagacaucua cagagacgag gcccugagca acagauucca gaucaagggc 1560

guggagcuga aggccggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaaccug 1680

agaugcaaca ucugcaucug a 1701

<210> 172537
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AID70459

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggccc ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaucgagaa guuccaccag aucgagaacg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacauc 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172538
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaucgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172539
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AID70461

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaucgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacaucgag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcauca ccugcaucug a 1701

<210> 172540
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaucgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172541
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AID70464

<400> 172541

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ggcgacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaucgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172542
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AID70465

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccac cacgccaucg accugaccga cagcgagaug 1380

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aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucac cgagagcugc 1620

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<210> 172543
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AID70466

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaucgagaa guuccaccag aucgagaacg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacauc 1320

ggcgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172544
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AID70467

<400> 172544
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaacu gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaucgagaa guuccaccag aucgagaacg aguucagcga gguggagggc 1260

agaauccagg gccuggagaa guacguggag gacaccaaga ucgaccugug gagcuacauc 1320

gccgagcuga ucguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag augagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172545
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AID70468

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaacu gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

augggcaaga gcaucgagaa guuccaccag aucgagaacg aguucagcga gguggagggc 1260

agaauccagg gccuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

ggcgagcuga ucguggcccu ggagaaccag cacgccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag augagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuaccu gaagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucac caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccagacagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172546
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaga acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaacu gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaucgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg gccuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag augagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucac caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172547
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AID70470

<400> 172547
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ggcaacgaga acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaacu gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaucgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg gccuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

ggcgagcugc ugguggcccu ggagaaccac cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag augagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucac caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172548
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AID70471

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaucgagaa guuccaccag aucgagaacg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcuga ucguggcccu ggagaaccac cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag augagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugaucu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaaccug 1680

agaugcaaca ucugcaucug a 1701

<210> 172549
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AID70472

<400> 172549
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaucgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccac cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag augagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172550
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AID70473

<400> 172550
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaacu gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaucgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg gccuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag augagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172551
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AID70474

<400> 172551
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cgugugggag 1080

ggcauggugg acggcugguu cggcuucaga caccagaucu gcgagggcag aggccaggcc 1140

gccggccugg agagcaccca ggccgccauc gaccagauca acggcaagau gaacagacug 1200

augggcaaga ccaucggcaa guuccaccag aucgugaacg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacauc 1320

ggcgagcugc ugguggcccu ggagaaccac cacgccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag augagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgaca gagacgugua cagagacgag gcccugaaca acagauucca caucaagggc 1560

guggagcuga agagcggcua caaggacugg aucaucugga ucagcagcac cgagagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaagcaaca ucugcaucug a 1701

<210> 172552
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaacu gcgagggcag aggccaggcc 1140

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augggcaaga ccaucggcaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcgagcugc ugguggcccu ggagaaccag cacgccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagaaacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcuga gcguggccag ccugggcuuc aucauguggg ccuaccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172553
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacaaccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaucgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg gcagagagaa guacguggag gacaccaaga ucgaccugug gagcuacauc 1320

ggcgaguuca ucguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag augagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172554
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AID70477

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ggcaacgaca gcagcaccgg cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacaga ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcauccu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga gauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugcu acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaucu gcgagggcag aggccaggcc 1140

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aucggcaaga ccaucgagaa guuccaccag aucgagaagg aguucagcga gguggagugg 1260

agaauccagg gccuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

ggcgagcuga ucguggcccu ggagaaccac cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag augagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuaccu gaagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucac cgagagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172555
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AID70478

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaacu gcgagggcag aggccaggcc 1140

gccgaccugg agagcaccca ggccgccauc gaccagauca acggcaagau gaacagacug 1200

augggcaaga ccaucgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg gcagagagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

ggcgagcugc ugguggaccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

aucuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccagugga ucagcuucac caucagcugc 1620

uuccugcugu gcgugagccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172556
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AID70632

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172557
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AID70634

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagaa ucaucgagaa gaccaaccag 1200

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172558
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72902

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172559
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72903

<400> 172559

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg gugcugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172560
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72904

<400> 172560
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagcg ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg gugcugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172561
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72905

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagcg ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172562
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72906

<400> 172562
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172563
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72907

<400> 172563
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172564
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72908

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172565
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72909

<400> 172565
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagcg ccggcgagau cugcgacggc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcaccac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172566
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72910

<400> 172566
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172567
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72911

<400> 172567
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172568
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIF72912

<400> 172568
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagcg ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag cagagccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172569
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72913

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172570
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIF72914

<400> 172570
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aggcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccacg accuggagaa guacguggag gacacccugu ucgaccugug gguguacaac 1320

agcgagcugc ugguggcccu gcagaaccag cacaccaucg accugcccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172571
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72915

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccugcaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcaa cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172572
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72916

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172573
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIF72917

<400> 172573
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agaaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa gaacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcgaca ucugcaucug a 1701

<210> 172574
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIG44693

<400> 172574
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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaaggacaa cgccuacccc auccaggacg cccaguacac caacaaccag 540

gagaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugcacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc aagagccacg gcagaauccu gaagaccgac 840

cugaagagag gcaacugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccuggguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gaagcagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 172575
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10728

<400> 172575
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172576
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10729

<400> 172576
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ggccacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccaagggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172577
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AIJ10730

<400> 172577

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172578
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172579
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucagaua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172580
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10733

<400> 172580
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucagaua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172581
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10734

<400> 172581
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172582
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10735

<400> 172582
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172583
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10736

<400> 172583
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcacca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172584
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10737

<400> 172584
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172585
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10738

<400> 172585
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcacuuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172586
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10740

<400> 172586
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172587
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10741

<400> 172587
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172588
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIJ10742

<400> 172588
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

gccaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172589
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10743

<400> 172589
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaucaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172590
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10744

<400> 172590
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagaacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172591
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10745

<400> 172591
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172592
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10747

<400> 172592
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172593
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10748

<400> 172593
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagaac 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172594
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10750

<400> 172594
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ucagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172595
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10752

<400> 172595

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caugagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172596
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10753

<400> 172596
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172597
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10754

<400> 172597
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172598
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10755

<400> 172598
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca gagcgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172599
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10756

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172600
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10757

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172601
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10758

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172602
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10759

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172603
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10760

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172604
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10761

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagaaacgag gcccugaaca agagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172605
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10762

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172606
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIJ10763

<400> 172606
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172607
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10764

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172608
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10765

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172609
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AIJ10766

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172610
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10767

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172611
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacaucccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172612
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10769

<400> 172612
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172613
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10770

<400> 172613

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172614
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10771

<400> 172614
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172615
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<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 172616
<211> 1701
<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172617
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<212> RNA
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aacagcagca ucggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172618
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AIJ10776

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172619
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AIJ10777

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaugcaaca ucugcaucug a 1701

<210> 172620
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10778

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaugcaaca ucugcaucug a 1701

<210> 172621
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10780

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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<210> 172622
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AIJ10781

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172623
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<212> RNA
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hemagglutinin__InfluenzaA__AIJ10782

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172624
<211> 1701
<212> RNA
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ugggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172625
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ugggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172626
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172627
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__AIJ10786

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 172628
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10787

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172629
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10788

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca gagcgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172630
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10789

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca gagcgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172631
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10790

<400> 172631

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ugggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172632
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ10791

<400> 172632
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172633
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ10792

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ggcgacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172634
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ29347

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172635
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ29349

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172636
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ29351

<400> 172636
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172637
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ29353

<400> 172637
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcaccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172638
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AIJ29355

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagaag cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172639
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ29357

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172640
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIJ29359

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gccaucaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172641
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIJ29361

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172642
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIL93623

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172643
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL93634

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcaacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172644
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL93645

<400> 172644
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucagaua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 172645
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL93657

<400> 172645
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172646
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__AIL93669

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172647
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaag cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172648
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL93692

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucagaua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172649
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AIL93716

<400> 172649

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucagaua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172650
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL93728

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172651
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL93740

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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agaugcaaca ucugcaucug a 1701

<210> 172652
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL93752

<400> 172652
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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172653
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL93764

<400> 172653
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacgag 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172654
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL93776

<400> 172654
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172655
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL93788

<400> 172655
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172656
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL93812

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172657
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL93824

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172658
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL93836

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaag cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172659
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL93847

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaag cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172660
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIL93858

<400> 172660
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucagaua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172661
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL93870

<400> 172661
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172662
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL93882

<400> 172662
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172663
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL93894

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172664
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL93906

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcau caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172665
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacaga ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172666
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL93929

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 172667
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL93940

<400> 172667

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugagcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172668
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIL93951

<400> 172668
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172669
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL93963

<400> 172669
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172670
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL93975

<400> 172670
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172671
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL93987

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaag cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172672
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL93998

<400> 172672
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172673
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94010

<400> 172673
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172674
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94022

<400> 172674
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172675
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94046

<400> 172675
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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agaugcaaca ucugcaucug a 1701

<210> 172676
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94058

<400> 172676
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca ucgagagaag cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172677
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94069

<400> 172677
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaag cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172678
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIL94080

<400> 172678
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172679
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94235

<400> 172679
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucagaua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172680
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94247

<400> 172680
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172681
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94258

<400> 172681
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172682
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94270

<400> 172682
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172683
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94282

<400> 172683
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172684
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94294

<400> 172684
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<212> RNA
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<400> 172685

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172686
<211> 1701
<212> RNA
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<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172687
<211> 1701
<212> RNA
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172688
<211> 1701
<212> RNA
<213> Artificial Sequence

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<400> 172688
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 172689
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__AIL94365

<400> 172689
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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

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aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaugcaaca ucugcaucug a 1701

<210> 172690
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94377

<400> 172690
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<210> 172691
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AIL94389

<400> 172691
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 172692
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94411

<400> 172692
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172693
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94423

<400> 172693
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172694
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94435

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaag cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172695
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94446

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172696
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIL94458

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172697
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94470

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172698
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94481

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg aucaucugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172699
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94493

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagaagaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagcuu ccccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172700
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94504

<400> 172700
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaag cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__AIL94515

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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hemagglutinin__InfluenzaA__AIL94527

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 172703
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<400> 172703

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 172704
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaag cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172705
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AIL94561

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172706
<211> 1701
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<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AIL94573

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gugaucguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

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<210> 172707
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94584

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aucaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcagaugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172708
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94595

<400> 172708
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172709
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94606

<400> 172709
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172710
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94618

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172711
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94629

<400> 172711
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaag cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172712
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94640

<400> 172712
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172713
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94652

<400> 172713
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcau caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcuggaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172714
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIL94663

<400> 172714
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172715
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94674

<400> 172715
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172716
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94697

<400> 172716
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172717
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94709

<400> 172717
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172718
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94720

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172719
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172720
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94743

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaag cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172721
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94754

<400> 172721

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcuga uccugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172722
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIL94765

<400> 172722
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacaga ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172723
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94777

<400> 172723
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172724
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94789

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cauccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172725
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94800

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172726
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94811

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172727
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94823

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172728
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94835

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacuacagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172729
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94847

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacga cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172730
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94859

<400> 172730
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172731
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94871

<400> 172731
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca ccaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172732
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 172733
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AIL94894

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agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172734
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<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172735
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AIL94918

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172736
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94930

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172737
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94942

<400> 172737
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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 172738
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIL94954

<400> 172738
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

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<210> 172739
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIL94965

<400> 172739

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172740
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM55837

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugagc cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172741
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM55848

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacacc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172742
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM55859

<400> 172742
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172743
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM55870

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172744
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM55881

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172745
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM55893

<400> 172745
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172746
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM55904

<400> 172746
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172747
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM55915

<400> 172747
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172748
<211> 1710
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM55926

<400> 172748
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gaccagccug cccuuccaga acauccaccc caucaccauc 960

ggcaagugcc ccaaguacgu gaagagcacc aagcugagac uggccaccgg ccugagaaac 1020

gugcccagca uccagagcag aggccuguuc ggcgccaucg ccggcuucau cgagggcggc 1080

uggaccggca ugguggacgg cugguacggc uaccaccacc agaacgagca gggcagcggc 1140

uacgccgccg accugaagag cacccagaac gccaucgaca agaucaccaa caaggugaac 1200

agcgugaucg agaagaugaa cacccaguuc accgccgugg gcaaggaguu caaccaccug 1260

gagaagagaa ucgagaaccu gaacaagaag guggacgacg gcuuccugga caucuggacc 1320

uacaacgccg agcugcuggu gcugcuggag aacgagagaa cccuggacua ccacgacagc 1380

aacgugaaga accuguacga gaaggugaga aaccagcuga agaacaacgc caaggagauc 1440

ggcaacggcu gcuucgaguu cuaccacaag ugcgacaaca ccugcaugga gagcgugaag 1500

aacggcaccu acgacuaccc caaguacagc gaggaggcca agcugaacag agagaagauc 1560

gacggcguga agcuggagag caccagaauc uaccagaucc uggccaucua cagcaccgug 1620

gccagcagcc uggugcuggu ggugagccug ggcgccauca gcuucuggau gugcagcaac 1680

ggcagccugc agugcagaau cugcaucuga 1710

<210> 172749
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM55937

<400> 172749
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172750
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIM55948

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172751
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM55962

<400> 172751
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172752
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM55984

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172753
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM55995

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172754
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56017

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggccaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172755
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIM56028

<400> 172755
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggccaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172756
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56039

<400> 172756
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggaggccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172757
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56050

<400> 172757

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gaggcaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172758
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56061

<400> 172758
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172759
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56072

<400> 172759
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172760
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56083

<400> 172760
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaccaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172761
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56105

<400> 172761
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172762
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56116

<400> 172762
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172763
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56127

<400> 172763
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172764
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56138

<400> 172764
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172765
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56149

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172766
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56160

<400> 172766
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaccaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172767
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56171

<400> 172767
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172768
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIM56182

<400> 172768
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca aggagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172769
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56193

<400> 172769
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaaggu gaccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172770
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56204

<400> 172770
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172771
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56215

<400> 172771
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172772
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56226

<400> 172772
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172773
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIM56237

<400> 172773
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172774
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56259

<400> 172774
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172775
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56270

<400> 172775

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccguga acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172776
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56281

<400> 172776
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172777
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56292

<400> 172777
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggagauc cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172778
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56303

<400> 172778
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccaggugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172779
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56314

<400> 172779
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aagcuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172780
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56325

<400> 172780
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172781
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56336

<400> 172781
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaagaucag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172782
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56347

<400> 172782
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172783
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56358

<400> 172783
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug gugaagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172784
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56369

<400> 172784
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172785
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56380

<400> 172785
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugagca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172786
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIM56391

<400> 172786
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172787
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56402

<400> 172787
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172788
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56413

<400> 172788
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaccaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172789
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56425

<400> 172789
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172790
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56436

<400> 172790
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172791
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIM56447

<400> 172791
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172792
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56469

<400> 172792
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172793
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56480

<400> 172793

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucacccu gggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172794
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56491

<400> 172794
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172795
<211> 1710
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIM56502

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gaccagccug cccuuccaga acauccaccc caucaccauc 960

ggcaagugcc ccaaguacgu gaagagcacc aagcugagac uggccaccgg ccugagaaac 1020

aucccccagca uccagagcag aggccuguuc ggcgccaucg ccggcuucau cgagggcggc 1080

uggaccggca ugguggacgg cugguacggc uaccaccacc agaacgagca gggcagcggc 1140

uacgccgccg accugaagag cacccagaac gccaucgaca agaucaccaa caaggugaac 1200

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gagaagagaa ucgagaaccu gaacaagaag guggacgacg gcuuccugga caucuggacc 1320

uacaacgccg agcugcuggu gcugcuggag aacgagagaa cccuggacua ccacgacagc 1380

aacgugaaga accuguacga gaaggugaga aaccagcuga agaacaacgc caaggagauc 1440

ggcaacggcu gcuucgaguu cuaccacaag ugcgacaaca ccugcaugga gagcgugaag 1500

aacggcaccu acgacuaccc caaguacagc gaggaggcca agcugaacag agagaagauc 1560

gacggcguga agcuggagag caccagaauc uaccagaucc uggccaucua cagcaccgug 1620

gccagcagcc uggugcuggu ggugagccug ggcgccauca gcuucuggau gugcagcaac 1680

ggcagccugc agugcagaau cugcaucuga 1710

<210> 172796
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIM56513

<400> 172796
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172797
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIM56524

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccauccac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172798
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIM56535

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172799
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56546

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172800
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56557

<400> 172800
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaccaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172801
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56568

<400> 172801
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu ucagcaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172802
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56579

<400> 172802
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacgagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacaccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugagcuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172803
<211> 1710
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56590

<400> 172803
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gaccagccug cccuuccaga acauccaccc caucaccauc 960

ggcaagugcc ccaaguacgu gaagagcacc aagcugagac uggccaccgg ccugagaaac 1020

gugcccagca uccagagcag aggccuguuc ggcgccaucg ccggcuucau cgagggcggc 1080

uggaccggca ugguggacgg cugguacggc uaccaccacc agaacgagca gggcagcggc 1140

uacgccgccg accugaagag cacccagaac gccaucgaca agaucaccaa caaggugaac 1200

agcgugaucg agaagaugaa cacccaguuc accgccgugg gcaaggaguu caaccaccug 1260

gagaagagaa ucgagaaccu gaacaagaag guggacgacg gcuuccugga caucuggacc 1320

uacaacgccg agcugcuggu gcugcuggag aacgagagaa cccuggacua ccacgacagc 1380

aacgugaaga accuguacga gaaggugaga aaccagcuga agaacaacgc caaggagauc 1440

ggcaacggcu gcuucgaguu cuaccacaag ugcgacgaca ccugcaugga gagcgugaag 1500

aacggcaccu acgacuaccc caaguacagc gaggaggcca agcugaacag agagaagauc 1560

gacggcguga agcuggagag caccagaauc uaccagaucc uggccaucua cagcaccgug 1620

gccagcagcc uggugcuggu ggugagccug ggcgccauca gcuucuggau gugcagcaac 1680

ggcagccugc agugcagaau cugcaucuga 1710

<210> 172804
<211> 1710
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIM56601

<400> 172804
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gaccagccug cccuuccaga acauccaccc caucaccauc 960

ggcaagugcc ccaaguacgu gaagagcacc aagcugagac uggccaccgg ccugagaaac 1020

gugcccagca uccagagcag aggccuguuc ggcgccaucg ccggcuucau cgagggcggc 1080

uggaccggca ugguggacgg cugguacggc uaccaccacc agaacgagca gggcagcggc 1140

uacgccgccg accugaagag cacccagaac gccaucgaca agaucaccaa caaggugaac 1200

agcgugaucg agaagaugaa cacccaguuc accgccgugg gcaaggaguu caaccaccug 1260

gagaagagaa ucgagaaccu gaacaagaag guggacgacg gcuuccugga caucuggacc 1320

uacaacgccg agcugcuggu gcugcuggag aacgagagaa cccuggacua ccacgacagc 1380

aacgugaaga accuguacga gaaggugaga aaccagcuga agaacaacgc caaggagauc 1440

ggcaacggcu gcuucgaguu cuaccacaag ugcgacaaca ccugcaugga gagcgugaag 1500

aacggcaccu acgacuaccc caaguacagc gaggaggcca agcugaacag agagaagauc 1560

gacggcguga agcuggagag caccagaauc uaccagaucc uggccaucua cagcaccgug 1620

gccagcagcc uggugcuggu ggugagccug ggcgccauca gcuucuggau gugcagcaac 1680

ggcagccugc agugcagaau cugcaucuga 1710

<210> 172805
<211> 1710
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56612

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa caccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gaccagccug cccuuccaga acauccaccc caucaccauc 960

ggcaagugcc ccaaguacgu gaagagcacc aagcugagac uggccaccgg ccugagaaac 1020

gugcccagca uccagagcag aggccuguuc ggcgccaucg ccggcuucau cgagggcggc 1080

uggaccggca ugguggacgg cugguacggc uaccaccacc agaacgagca gggcagcggc 1140

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agcgugaucg agaagaugaa cacccaguuc accgccgugg gcaaggaguu caaccaccug 1260

gagaagagaa ucgagaaccu gaacaagaag guggacgacg gcuuccugga caucuggacc 1320

uacaacgccg agcugcuggu gcugcuggag aacgagagaa cccuggacua ccacgacagc 1380

aacgugaaga accuguacga gaaggugaga aaccagcuga agaacaacgc caaggagauc 1440

ggcaacggcu gcuucgaguu cuaccacaag ugcgacaaca ccugcaugga gagcgugaag 1500

aacggcaccu acgacuaccc caaguacagc gaggaggcca agcugaacag agagaagauc 1560

gacggcguga agcuggagag caccagaauc uaccagaucc uggccaucua cagcaccgug 1620

gccagcagcc uggugcuggu ggugagccug ggcgccauca gcuucuggau gugcagcaac 1680

ggcagccugc agugcagaau cugcaucuga 1710

<210> 172806
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56623

<400> 172806
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaccug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172807
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56634

<400> 172807
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc aacagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172808
<211> 1710
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56645

<400> 172808
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gaccagccug cccuuccaga acauccaccc caucaccauc 960

ggcaagugcc ccaaguacgu gaagagcacc aagcugagac uggccaccgg ccugagaaac 1020

gugcccagca uccagagcag aggccuguuc ggcgccaucg ccggcuucau cgagggcggc 1080

uggaccggca ugguggacgg cugguacggc uaccaccacc agaacgagca gggcagcggc 1140

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gagaagagaa ucgagaaccu gaacaagaag guggacgacg gcuuccugga caucuggacc 1320

uacaacgccg agcugcuggu gcugcuggag aacgagagaa cccuggacua ccacgacagc 1380

aacgugaaga accuguacga gaaggugaga aaccagcuga agaacaacgc caaggagauc 1440

ggcaacggcu gcuucgaguu cuaccacaag ugcgacaaca ccugcaugga gagcgugaag 1500

aacggcaccu acgacuaccc caaguacagc gaggaggcca agcugaacag agagaagauc 1560

gacggcguga agcuggagag caccagaauc uaccagaucc uggccaucua cagcaccgug 1620

gccagcagcc uggugcuggu ggugagccug ggcgccauca gcuucuggau gugcagcaac 1680

ggcagccugc agugcagaau cugcaucuga 1710

<210> 172809
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIM56656

<400> 172809
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac caacagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca acaucguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172810
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIM56667

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172811
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56678

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugcccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172812
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56689

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcagaaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172813
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AIM56700

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172814
<211> 1710
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AIM56711

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg ugcccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gaccagccug cccuuccaga acauccaccc caucaccauc 960

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uggaccggca ugguggacgg cugguacggc uaccaccacc agaacgagca gggcagcggc 1140

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uacaacgccg agcugcuggu gcugcuggag aacgagagaa cccuggacua ccacgacagc 1380

aacgugaaga accuguacga gaaggugaga aaccagcuga agaacaacgc caaggagauc 1440

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aacggcaccu acgacuaccc caaguacagc gaggaggcca agcugaacag agagaagauc 1560

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gccagcagcc uggugcuggu ggugagccug ggcgccauca gcuucuggau gugcagcaac 1680

ggcagccugc agugcagaau cugcaucuga 1710

<210> 172815
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56722

<400> 172815
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcagaaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172816
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56733

<400> 172816
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172817
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIM56744

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172818
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIM56755

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccagccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172819
<211> 1710
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AIM56766

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gaccagccug cccuuccaga acauccaccc caucaccauc 960

ggcaagugcc ccaaguacgu gaagagcacc aagcugagac uggccaccgg ccugagaaac 1020

gugcccagca uccagagcag aggccuguuc ggcgccaucg ccggcuucau cgagggcggc 1080

uggaccggca ugguggacgg cugguacggc uaccaccacc agaacgagca gggcagcggc 1140

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gagaagagaa ucgagaaccu gaacaagaag guggacgacg gcuuccugga caucuggacc 1320

uacaacgccg agcugcuggu gcugcuggag aacgagagaa cccuggacua ccacgacagc 1380

aacgugaaga accuguacga gaaggugaga aaccagcuga agaacaacgc caaggagauc 1440

ggcaacggcu gcuucgaguu cuaccacaag ugcgacaaca ccugcaugga gagcgugaag 1500

aacggcaccu acgacuaccc caaguacagc gaggaggcca agcugaacag agagaagauc 1560

gacggcguga agcuggagag caccagaauc uaccagaucc uggccaucua cagcaccgug 1620

gccagcagcc uggugcuggu ggugagccug ggcgccauca gcuucuggau gugcagcaac 1680

ggcagccugc agugcagaau cugcaucuga 1710

<210> 172820
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AIM56777

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagggcaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuaccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172821
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIM56788

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugguu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172822
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AIM56799

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172823
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56810

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172824
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIM56821

<400> 172824
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172825
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIN76383

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aucugccugg gccaccacgc cgugagcaac ggcaccaagg ugaacacccu gaccgagaga 120

ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agaagaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcacca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgcccugau cgugugggggc auccaccaca gcgugagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug gugaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccugagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

aagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

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gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 172826
<211> 1689
<212> RNA
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hemagglutinin__InfluenzaA__AIP93103

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gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agauacagcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacggcug gacccagcac 420

gagaccgacg gcggcagcaa ggccugcgcc gugagcggca agcccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggccccaac uaccccgugg ccaagagaag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgaggccgag 600

cagagagccc uguaccagaa cgugggcacc uacgugagcg ccagcaccag cacccugaac 660

aagagaagca cccccgagau cgccgccaga cccaagguga gcggccuggg cagcagaaug 720

gaguucagcu ggacccugcu ggacgugugg gacaccauca gcuucgagag caccggcaac 780

cugguggccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccugggcaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cccagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacag aaucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agaagagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaagaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

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ugcaucuga 1689

<210> 172827
<211> 1689
<212> RNA
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gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggcagcaac uaccccgugg ccaagggcag cuacaacaac 540

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cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca cccccgagau cgccaccaga cccaagguga acggccuggg cggcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

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acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

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cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

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aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 172828
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AIR93971

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccagaagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172829
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIR93982

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccagaagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172830
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIR93993

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcggcagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccaacgccgg cagcaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa uggacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa caccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172831
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIR94000

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagcuu ccccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172832
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIR94116

<400> 172832
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aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccaccc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaaggacaa cgccuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucaacgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

aagagagccc ugggcagcaa cgccguggag gacggcaagg gcugcuucga gcuguaccac 1440

aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 172833
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<212> RNA
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agcagcagca ccggcagaau cugcgacaac ccccacagaa uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caacgccuac agcgacugcu accccuacua cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcaucag ccaggacggc accagcagca gcugcagaag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacggccugg aguacaagua ccccgcccag 540

aacgugacca ugcugaacaa cgacgaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcaga ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag cauccacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aggcggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaacugcg acagcgagug cgugaccccc 900

aacggcaaca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcccc 960

ugccccagau acaucaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcgu gcugggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gaucgagggc 1260

agagugcagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggugcu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgugc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcgccgugcu gcugggcuuc aucaccuggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172834
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugagaggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcu acaacggcaa gggcaacuuc 480

uacaagaacc ugcuguggcu gaccagaaag aacggccugu accccaaccu gagcaagagc 540

uacaccaaca acaaggagaa ggaggugcug auccuguggg gcgugcacca ccccagcaac 600

aucaaggacc agagaacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc accaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aaggagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac caccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagauc 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 172835
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hemagglutinin__InfluenzaA__AIT38360

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcu acaacggcaa gggcaacuuc 480

uacaagaacc ugcuguggcu gaccagaaag aacggccugu accccaaccu gagcaagagc 540

uacaccaaca acaaggagaa ggaggugcug auccuguggg gcgugcacca ccccagcaac 600

aucgaggacc agagaacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc accaagagac ccaaggugag aggccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aaggagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac caccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacaacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 172836
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AIT93147

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172837
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AIU39700

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172838
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__AIU39702

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcaucug a 1701

<210> 172839
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIU39704

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172840
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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<400> 172840
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cugaucaucc ccaagagcag cuggaccaac 420

cacgagacca gccugggcgu gagcgccgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac gacgccuacc ccaccaucaa gaucagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccacag caacaacgcc 600

gccgagcaga ccaaccugua caagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagcc aggugaacgg ccagagaggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agguggagua cggccacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

aagagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau cguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 172841
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIU46714

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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcauccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

aaguacagcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacggcug gacccagcac 420

aagaccgacg gcggcagcaa ggccugcgcc gugagcggca agcagagcuu cuucagaaac 480

augguguggc ugaccaagaa gggccagaac uaccccgugg ccaagagaag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaacga cgaggaggag 600

cagagagccc uguaccagaa gguggggcacc uacgugagcg ccagcaccag cacccugaac 660

aagagaagca cccccgagau cgccgccaga cccgagguga acggccuggg cagcagaaug 720

gaguucagcu ggacccugcu ggacgugugg gacaccauca acuucgagag caccggcaac 780

cugguggccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaucaag 840

accgagggca cccugggcaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacag aaucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacaacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaagaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaucg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 172842
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIV09219

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gagcaccacc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccggcagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag acuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ccagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gacaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172843
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIW60689

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcgacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagcauc uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaacu acgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgccua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172844
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIW60690

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcagaau cugcgacagc ccccacagaa uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcgacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucac caacgagggc 420

uucaacugga ccggcguggc ccaggacggc accagcuacg ccugcaagag aggcagcgug 480

aagagcuucu ucagcagacu gaacuggcug cacaagcugg aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgacaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaacu acgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgccua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172845
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIW60691

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172846
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIW60692

<400> 172846
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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ggcaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaacugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172847
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIW60693

<400> 172847

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcu gaacggcacc 120

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aacagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagcauc uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcaucaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172848
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AIW60694

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcu gaacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcagaau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcauc 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaccagccug uacgcccagg ccagcggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172849
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIW60695

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcguggc ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagcauc uacgcccagg cccccggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcaucaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacugca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgccagcauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172850
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AIW60696

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugga ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug caccagcuga aguacaagua ccccgcccug 540

aacguggcca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acagcgacca gaucagccug uacgcccagg cccccggcag agugaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cugggugaga 720

ggcgugagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacugca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgccagcauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172851
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIW60697

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

cacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagca gcugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgacaccg acagcgugca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172852
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIW60698

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

cacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucgacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aagagcuucu ucagcagacu gaacuggcug acccaccuga aguacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acagcgacca gaucagccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacaucagca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172853
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIW60699

<400> 172853
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ggcaacgaca acagcaccgc cacccugugc aucggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaagagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172854
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIW60700

<400> 172854
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ggcaacgaca acagcaccgc cacccugugc aucggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcggcau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gaucgccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgaggagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172855
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIW60701

<400> 172855
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172856
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AIW60702

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172857
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AIZ07211

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172858
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172859
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJD78175

<400> 172859
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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ccaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaaggacaa caccuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagagag gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucaacgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 172860
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJD78187

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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

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gccaccagcc ugggccaccc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaagacc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaaggacaa cgccuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagagag gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagagagccc ugggcagcaa cgccguggag gacggcaagg gcugcuucga gcuguaccac 1440

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caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 172861
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJD78199

<400> 172861
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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

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cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acgacggcac cagcaccgcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugacca gaaagaacgg cgacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 172862
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJD78211

<400> 172862
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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

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ggcaacccca gcugcgaccu gagccuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acgacggcac cagcaccgcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugacca gaaagaacgg cgacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag aagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 172863
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AJI76401

<400> 172863
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ggcuaccacg ccaacaacag caccgagaag guggacacca uccuggagag aaacgugacc 120

gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag agugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agauacagcc ugugcuaccc cggcagccug aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaga auccugccca aggacagaug gaccaaccac 420

accaccaccg gcggcagcaa ggccugcgcc gugagcggca agcccagcuu cuucagaaac 480

augguguggc ugaccaagaa gggccccaac uaccccgugg ccaagggcag cuacaacaac 540

accagcggcg agcagaugcu gaucaucugg ggcgugcacc accccaucga cgaggccgag 600

cagagagccc uguaccagaa cgugggcacc uacgugagcg ccagcaccag cacccuguac 660

aagagaagca uccccgagau cgccgccaga cccgagguga acggccuggg cagcagaaug 720

gaguucagcu ggacccugcu ggacgugugg gacaccauca acuucgagag caccggcaac 780

cugguggccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccugggcaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

acccagaagg ccuucgacgg caucaccaac aaggugaaca gcgugaucga gaagaugaac 1200

acccaguucg aggccguggg caaggaguuc aacaaccugg agaagagacu ggagaaccug 1260

aacaagagaa uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgag 1380

aaggugagaa ugcagcugag agacaacgug agagagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaagaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucauggugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 172864
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJI80137

<400> 172864
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172865
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJI80149

<400> 172865

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172866
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJI80161

<400> 172866
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172867
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80172

<400> 172867
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

agccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172868
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80196

<400> 172868
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacauca acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgaguucc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172869
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80208

<400> 172869
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacaga ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172870
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80220

<400> 172870
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172871
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80232

<400> 172871
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

agccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172872
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80244

<400> 172872
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172873
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJI80256

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172874
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AJI80268

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172875
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80280

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcaagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caaggagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172876
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AJI80292

<400> 172876
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaag cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172877
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80303

<400> 172877
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172878
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80315

<400> 172878
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaag cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172879
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80326

<400> 172879
augaaggcca uccugguggu gcugcuguac accuucgcca ccgccaacgc cgacacccug 60

ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagaagaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172880
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80337

<400> 172880
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcau caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaugu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccaacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172881
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AJI80348

<400> 172881
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172882
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80360

<400> 172882
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugccc 60

ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172883
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80372

<400> 172883

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172884
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80384

<400> 172884
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172885
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80395

<400> 172885
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172886
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80406

<400> 172886
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172887
<211> 1701

<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AJI80417

<400> 172887
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 172888
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AJI80428

<400> 172888
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172889
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AJI80439

<400> 172889
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172890
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJI80462

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 172891
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJI80474

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcau caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172892
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJI80485

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gugaccguga cccacagcau caaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172893
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJI80496

<400> 172893
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172894
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AJI80507

<400> 172894
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgcccac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggaggu gggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172895
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJI80518

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172896
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ98765

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172897
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcuucagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172898
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ98789

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172899
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ98801

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaaa caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172900
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ98813

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccguggug cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172901
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ98825

<400> 172901

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagaca cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172902
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ98837

<400> 172902
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172903
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ98849

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacu gagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172904
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ98861

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aucagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaagagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172905
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ98873

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172906
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ98885

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa ggagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172907
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ98897

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172908
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ98909

<400> 172908
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172909
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ98921

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ggcaaggaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugaa gcagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172910
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ98933

<400> 172910
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172911
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AJJ98945

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172912
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccacagca aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172913
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ98969

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172914
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ98981

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaca uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacgugccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172915
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ98993

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacaac ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172916
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99005

<400> 172916
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ucggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172917
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AJJ99017

<400> 172917
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172918
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AJJ99029

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172919
<211> 1701
<212> RNA
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<220>
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<400> 172919

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcgac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcggcug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc aaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172920
<211> 1701
<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172921
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172922
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaaa caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172923
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99101

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaugag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172924
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99113

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172925
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99125

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aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172926
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99137

<400> 172926
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagagugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgccug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgugagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172927
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99149

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga caugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccaggcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172928
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99161

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172929
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99173

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca gaaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172930
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AJJ99185

<400> 172930
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagagccga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172931
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99197

<400> 172931
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172932
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99209

<400> 172932
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaagag aaagagcgac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgaggaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caugagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172933
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99221

<400> 172933
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 172934
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AJJ99233

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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga aguucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

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ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 172935
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AJJ99244

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

ggcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172936
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AJJ99255

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gugaccguga cccacagcgu gaaccugcug gaggacaacc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccagagccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugaugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaaggaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172937
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99267

<400> 172937

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccaucaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccgugagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagagugu gcaucuga 1698

<210> 172938
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99278

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172939
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99289

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc guguucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 172940
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99301

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagagccu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 172941
<211> 1698

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99324

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag agcggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 172942
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99335

<400> 172942
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcaaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172943
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99357

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172944
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99368

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172945
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99379

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172946
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99390

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172947
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99401

<400> 172947
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172948
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AJJ99413

<400> 172948
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 172949
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99425

<400> 172949
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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hemagglutinin__InfluenzaA__AJJ99437

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccagccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcaa ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 172952
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<212> RNA
<213> Artificial Sequence

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccagagccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172954
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AJJ99494

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc guguucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 172955
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99505

<400> 172955

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcaaguaca gcaagaaguu caagcccgag aucgccguga gacccaaggu gagagaccag 720

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gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaagggcu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cagugcagaa ucugcaucug a 1701

<210> 172956
<211> 1701
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AJJ99516

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172957
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99527

<400> 172957
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccagagccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgugaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172958
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99538

<400> 172958
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172959
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99549

<400> 172959
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgc cgccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172960
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99560

<400> 172960
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172961
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99571

<400> 172961
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acauccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172962
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99582

<400> 172962
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172963
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99593

<400> 172963
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172964
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99604

<400> 172964
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccagagu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172965
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AJJ99616

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaagcugac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

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<212> RNA
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<220>
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<400> 172966
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 172967
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99640

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccaac 600

aucgccaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 172968
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99652

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 172969
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99664

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 172970
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99675

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccagagccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172971
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AJJ99686

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccagagccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172972
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99697

<400> 172972
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucguga uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172973
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99708

<400> 172973

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucguga uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagac cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172974
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99719

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgagggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172975
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172976
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99741

<400> 172976
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172977
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99752

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 172978
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99763

<400> 172978
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 172979
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99775

<400> 172979
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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

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aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

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uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 172980
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99786

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcgccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172981
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99798

<400> 172981
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagagaccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucgccaacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau guucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 172982
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99810

<400> 172982
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 172983
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99822

<400> 172983
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 172984
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AJJ99833

<400> 172984
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccagagccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccugaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172985
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99844

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172986
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99855

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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ugcuucgagu ucuaccacaa gugcgacagc accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172987
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJJ99866

<400> 172987
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172988
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hemagglutinin__InfluenzaA__AJJ99877

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaga 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172989
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaga cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gaucgacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 172990
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AJJ99899

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccagagccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa ccugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug cuggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacggcc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccguggac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 172991
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJJ99910

<400> 172991

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172992
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AJJ99921

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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cagugcagaa ucugcaucug a 1701

<210> 172993
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AJJ99932

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcgaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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<210> 172994
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172995
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AJJ99954

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ccagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaacugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__AJJ99965

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccagagccgg cgagaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 172999
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hemagglutinin__InfluenzaA__AJK00012

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173000
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc ccagagccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugcuggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173001
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__AJK00034

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagggc 480

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accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 173002
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173003
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AJK00056

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc accgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaugau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccac aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gaacagcuuc 480

uacagaaacc ugcuguggcu gaccagaaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucgccgacc agaagacccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccaucaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccccccaac 600

aucggcgugc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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gugcugcugg ugagccuggg cgccgugagc uucuggaugu gcagcaacgg cagccugcag 1680

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<210> 173007
<211> 1698
<212> RNA
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cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

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aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 173008
<211> 1701
<212> RNA
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cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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<210> 173009
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJK00125

<400> 173009

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<210> 173010
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJK00136

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<212> RNA
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hemagglutinin__InfluenzaA__AJK00166

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcaagcc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccacag caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

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<211> 1707
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AJK00177

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggggca uccaccacag caacgacgag 600

gccgagcaga ucaagcugua ccagaacccc accaccuacg ugagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccgacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

aagagaagaa gaaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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ggcaccuacg acuacccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173013
<211> 1704

<212> RNA
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccacag caacgacgag 600

gccgagcaga ucaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccgacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

aagagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 173014
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJK00207

<400> 173014
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

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aacaacacca gccaggagga ccugcuggug cugugggggca uccaccacag caacgacgcc 600

accgagcaga ugaagcugua ccagaacccc accaccuacg ugagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc agcaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

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ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 173015
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<212> RNA
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hemagglutinin__InfluenzaA__AJK00218

<400> 173015
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc agaaucaucc ccaagagcag cuggcccgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacaucg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca gccaggagga ccugcuggug cugugggca uccaccacag cagcgacgcc 600

accgagcaga ucaagcugua ccagaacccc accaccuacg ugagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agguggagua cggcaacugc agcaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cgccgccagc 1620

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cugcagugca gaaucugcau cuga 1704

<210> 173016
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJK00239

<400> 173016
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

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agaauggacu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

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aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

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cugcagugca gaaucugcau cuga 1704

<210> 173017
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJS18468

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accgugaccc acgcccagga cauccuggag aagacccaca acggcagacu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagacc cugaucaucc ccaagagcag cuggcccaac 420

cacgagacca gccugggcgu gagcgccgcc ugccccuacc agggcgugcc cagcuucuuc 480

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aacaacacca acagagagga ccugcugauc cugugggca uccaccacag caacaacgcc 600

gccgagcaga ccaaccugua caagaacccc accaccuacg ugagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagcc aggugaacgg ccagagaggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agauggagua cggccacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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gccgacagag agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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<210> 173018
<211> 1704
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AJS18479

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcagacu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagacc cugaucaucc ccaagagcag cuggcccaac 420

cacgagacca gccugggcgu gagcgccgcc ugccccuacc agggcaugcc cagcuucuuc 480

agaaacgugg uguggcugac caagaagaac gacaccuacc ccaccaucaa gaugagcuac 540

aacaacacca acagagagga ccugcugauc cugugggggca uccaccacag caacaacgcc 600

gccgagcaga ccaaccugua caagaacccc accaccuacg ugagcguggg caccgccacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagcc aggugaacgg ccagagaggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agauggagua cggccacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

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gccgacagag agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau cguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 173019
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AJY79339

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaaggacag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacgac gccuacccca ccaucaagaa gagcuacaac 540

aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgccgcc 600

gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgagc uggaguacag caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gggcgagaag 1020

agaagaaaga agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gagagccauc gacggcguga ccaacaaggu gaacagcauc 1200

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ggcugcuucg aguucuacca cagaugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 173020
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<212> RNA
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<220>
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaaggacag cuggagcgac 420

cacgagacca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacgac gccuacccca ccaucaagaa gagcuacaac 540

aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgccgcc 600

gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gaacggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

agaagcgagc uggaguacag caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gggcgagaag 1020

agaagaaaga agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gagagccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca cagaugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 173021
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaaggacag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacgac gccuacccca ccaucaagaa gagcuacaac 540

aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgccgcc 600

gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgagc uggaguacag caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gggcgagaag 1020

agaagaaaga agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gagagccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca cagaugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 173022
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJY79343

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaaggacag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacgac gccuacccca ccaucaagaa gagcuacaac 540

aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgccgcc 600

gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgagc uggaguacag caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gggcgagaag 1020

agaagaaaga agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gagagccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

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agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 173023
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJY79345

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugacca gagcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaaggacag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacgac gccuacccca ccaucaagaa gagcuacaac 540

aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgccgcc 600

gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgagc uggaguacag caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gggcgagaag 1020

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ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gagagccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca cagaugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

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cugcagugca gaaucugcau cuga 1704

<210> 173024
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AKA54643

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173025
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AKA54650

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173026
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AKA54651

<400> 173026
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ggcagcgaca acagcauggc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccga cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcaccagca agggcgagau cugcagcagc ccccaccaga uccuggacgg caagaacugc 240

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agcaccaagu ggagccagca gaccgugauc cccaacaucg gcagcagacc cuggaucaga 720

ggcgugagca gcaucaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucaagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagag auacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gccgugaaca acagauucca gaucaagggc 1560

gugcagcuga agcugggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcgccgugcu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173027
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AKA59351

<400> 173027

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gugaccguga cccacagcgu ggaccugcug gaggacaagc acaacggcag acugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccaggccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 173028
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AKA59353

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc gagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcaaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaacac cagcagcugg 420

cccaaccacg acagcagcaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagaa gcuguaccag aacgaggacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca acaucguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 173029
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AKA59355

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccagaagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaaccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagagu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 173030
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AKE37137

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg accccaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcacc 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacgccuu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacgugcacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173031
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AKS48035

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accgugaccc acgcccagga cauccuggag aagacccaca acggcagacu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagacc cugaucaucc ccaagagcag cuggcccaac 420

cacaccagca gcggcgugag cgccgccugc cccuaccagg gcaugcccag cuucuucaga 480

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auggacuucu ucuggaccau ccugaagccc aacgacgcca uccacuucga gagcaacggc 780

aacuucaucg cccccgagua cgccuacaag aucgugaaga agggcgacag caccaucaug 840

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aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

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agaagaaaga gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggcagggc 1080

augguggacg gcugguacgg cuaccaccac agcaacgagc agggcagcgg cuacgccgcc 1140

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cuggcccugg ccaucaucgu ggccggccug agccugugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173032
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALA08472

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acguguggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173033
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08475

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173034
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08478

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagagaugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173035
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08479

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173036
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08481

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173037
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALA08482

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173038
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173039
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08484

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccauc 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173040
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08488

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ggcaacggca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173041
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08490

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173042
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08491

<400> 173042
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacaugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173043
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALA08492

<400> 173043
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173044
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08493

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca gaagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173045
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08494

<400> 173045

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173046
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08495

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173047
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08496

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173048
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08497

<400> 173048
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173049
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08498

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173050
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08499

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173051
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08501

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagagaugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173052
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08502

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173053
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08503

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173054
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08504

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173055
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08505

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173056
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALA08506

<400> 173056
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173057
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08507

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173058
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08508

<400> 173058
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173059
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08509

<400> 173059
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173060
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08510

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173061
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08511

<400> 173061
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccagcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173062
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08512

<400> 173062
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173063
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08514

<400> 173063

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173064
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08515

<400> 173064
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173065
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08516

<400> 173065
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173066
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08517

<400> 173066
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173067
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08519

<400> 173067
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173068
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08520

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aaacggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173069
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08522

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173070
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08523

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ucggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173071
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08524

<400> 173071
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacu gagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173072
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08525

<400> 173072
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173073
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08526

<400> 173073
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173074
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALA08527

<400> 173074
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173075
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08528

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuaccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag augagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173076
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08529

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173077
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08530

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173078
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08531

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

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agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173079
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08532

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173080
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08533

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173081
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08534

<400> 173081

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173082
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08535

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173083
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08536

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173084
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08537

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173085
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08538

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173086
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08539

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173087
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08540

<400> 173087
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173088
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08541

<400> 173088
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173089
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08542

<400> 173089
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173090
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08543

<400> 173090
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgccauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173091
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08545

<400> 173091
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173092
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALA08546

<400> 173092
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173093
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08548

<400> 173093
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcguggc ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173094
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08549

<400> 173094
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ccggcgugau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173095
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08550

<400> 173095
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173096
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08551

<400> 173096
augaagacca ucaucgcccu gagcuacauc cugugccugg uguucgccca gaagcugcug 60

gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173097
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08552

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173098
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08553

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173099
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08554

<400> 173099

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga ugagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173100
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08555

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccagcaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173101
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08556

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcaucac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173102
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08557

<400> 173102
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173103
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08558

<400> 173103
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173104
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08559

<400> 173104
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagcg ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173105
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<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173106
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa ggagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173107
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08563

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagauccu gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173108
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08571

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caccagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173109
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08572

<400> 173109
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca gaagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173110
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALA08573

<400> 173110
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173111
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08574

<400> 173111
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173112
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08575

<400> 173112
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173113
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<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08576

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173114
<211> 1701
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<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08577

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173115
<211> 1701
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hemagglutinin__InfluenzaA__ALA08579

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173116
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08580

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173117
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08582

<400> 173117

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173118
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08583

<400> 173118
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaugcaaca ucugcaucug a 1701

<210> 173119
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08584

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agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173120
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08585

<400> 173120
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173121
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173122
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173123
<211> 1701
<212> RNA
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<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173124
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08589

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173125
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08590

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173126
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08591

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173127
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08592

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caugagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg acuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucagccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaucua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173138
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<220>
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hemagglutinin__InfluenzaA__ALA08605

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173141
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08609

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 173142
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08610

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 173143
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccacagaa uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaugcaaca ucugcaucug a 1701

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

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agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<212> RNA
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hemagglutinin__InfluenzaA__ALA08621

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173152
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<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagauccu gagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173155
<211> 1701
<212> RNA
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<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173156
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALA08626

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173157
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08627

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 173158
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08629

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173159
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173160
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALA08631

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa ggagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173161
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ALA08632

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacgugg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173162
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08634

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173163
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08635

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173164
<211> 1701
<212> RNA
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<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cauccaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173165
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08637

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173166
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08638

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173167
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08639

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173169
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08641

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aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173170
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08642

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173171
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08643

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 173172
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08644

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173173
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08645

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173174
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08646

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173175
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08647

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173176
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08648

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aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173177
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgagagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173178
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08652

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aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173179
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08653

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173180
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08654

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173181
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08655

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173182
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALA08656

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173183
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<220>
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hemagglutinin__InfluenzaA__ALA08657

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aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<220>
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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173185
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

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<211> 1701
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<220>
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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173187
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALA08662

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaugcaaca ucugcaucug a 1701

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<220>
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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<212> RNA
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<220>
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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 173190
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08666

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caugagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gccaucaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173193
<211> 1701

<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173195
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08671

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173196
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALA08672

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173197
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173198
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALA08674

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<212> RNA
<213> Artificial Sequence

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173200
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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hemagglutinin__InfluenzaA__ALA08677

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173202
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08678

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173203
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08679

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 173204
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08680

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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<210> 173205
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALA08681

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173206
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALA08682

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaucua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173207
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<212> RNA
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<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173208
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<212> RNA
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<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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hemagglutinin__InfluenzaA__ALA08686

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173210
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<212> RNA
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<220>
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173211
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__ALA08688

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 173212
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31612

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

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<210> 173213
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALE31613

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gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

cugcugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173214
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<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31614

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcaagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173215
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173216
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31616

<400> 173216
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173217
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31617

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173218
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE31618

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173219
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31619

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173220
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31620

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173221
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31622

<400> 173221
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgugcccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALE31623

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALE31625

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173224
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ALE31626

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<211> 1701
<212> RNA
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<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173226
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31628

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173227
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31629

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173228
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31632

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 173229
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31634

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<212> RNA
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hemagglutinin__InfluenzaA__ALE31635

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<212> RNA
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<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<212> RNA
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacgg caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173233
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173234
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ALE31640

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173235
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31641

<400> 173235
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173236
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE31642

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173237
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31643

<400> 173237
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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hemagglutinin__InfluenzaA__ALE31645

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173240
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173241
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALE31647

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173242
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hemagglutinin__InfluenzaA__ALE31648

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173243
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31649

<400> 173243

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 173244
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31650

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 173245
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31652

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucagccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 173246
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173247
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALE31654

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173248
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALE31655

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173249
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ALE31656

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173250
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31657

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173251
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALE31658

<400> 173251
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173252
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31659

<400> 173252
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaugcaaca ucugcaucug a 1701

<210> 173253
<211> 1701
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hemagglutinin__InfluenzaA__ALE31660

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga agagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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aucgugaaga ccaucgccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

cugcugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173256
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173257
<211> 1701
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<220>
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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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<211> 1701
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<220>
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gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173259
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31668

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173260
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALE31669

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173261
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31670

<400> 173261

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag augagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173262
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31671

<400> 173262
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173263
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31672

<400> 173263
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173264
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31673

<400> 173264
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173265
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31674

<400> 173265
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaca gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173266
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31675

<400> 173266
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173267
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31676

<400> 173267
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc caagaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacagcaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173268
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31677

<400> 173268
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173269
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31678

<400> 173269
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173270
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31679

<400> 173270
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173271
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31680

<400> 173271
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173272
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE31681

<400> 173272
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173273
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31682

<400> 173273
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173274
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31683

<400> 173274
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173275
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31684

<400> 173275
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173276
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31685

<400> 173276
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173277
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173278
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31687

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173279
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31688

<400> 173279

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173280
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31689

<400> 173280
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173281
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31690

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173282
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31691

<400> 173282
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173283
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31692

<400> 173283
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuacagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173284
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31693

<400> 173284
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuacagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173285
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31694

<400> 173285
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173286
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31695

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuacagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173287
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31696

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173288
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31697

<400> 173288
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuacagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173289
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31698

<400> 173289
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173290
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE31699

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccaac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacgccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173291
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31700

<400> 173291
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173292
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31701

<400> 173292
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173293
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<213> Artificial Sequence

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173294
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALE31703

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173295
<211> 1701
<212> RNA
<213> Artificial Sequence

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173296
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173297
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31706

<400> 173297

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 173298
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31707

<400> 173298
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 173299
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31708

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacu gagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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agaauccagg accuggagaa guacguggag gacagcaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cauccaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<211> 1701
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<220>
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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 173306
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<220>
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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 173307
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALE31716

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaauccagg accuggagaa guacguggag gacagcaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 173308
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<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga ccagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaccac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173309
<211> 1701
<212> RNA
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<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173310
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALE31719

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacaucccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173311
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<220>
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hemagglutinin__InfluenzaA__ALE31720

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173312
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173313
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173314
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31723

<400> 173314
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173315
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31724

<400> 173315

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173317
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<212> RNA
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173318
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ALE31727

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173319
<211> 1701

<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALE31728

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca uccccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173320
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31729

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga ucaucgacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173321
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31730

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 173322
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31731

<400> 173322
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 173323
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31732

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuucagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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hemagglutinin__InfluenzaA__ALE31739

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 173331
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acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173332
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagagugac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173334
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173335
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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacu gagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173336
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31747

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cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173337
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31748

<400> 173337
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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173338
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31749

<400> 173338
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173339
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ALE31750

<400> 173339
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173340
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31751

<400> 173340
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccugg acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173341
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31752

<400> 173341
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173342
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31753

<400> 173342
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173343
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31754

<400> 173343
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173344
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE31755

<400> 173344
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173345
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31756

<400> 173345
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173346
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31757

<400> 173346
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173347
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31758

<400> 173347
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gguggccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173348
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31759

<400> 173348
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagagaugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag agugaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacaa caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173349
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuacagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacgccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173350
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31761

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173351
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31762

<400> 173351

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173352
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31763

<400> 173352
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173353
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31764

<400> 173353
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173354
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31765

<400> 173354
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173355
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31774

<400> 173355
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gguguuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173356
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31775

<400> 173356
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgaguucc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173357
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31776

<400> 173357
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgccagcauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173358
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31777

<400> 173358
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccguggug cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173359
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31778

<400> 173359
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagauccu gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173360
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31779

<400> 173360
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173361
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31780

<400> 173361
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaaccga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173362
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE31781

<400> 173362
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcggcagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcaagcu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173363
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<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgugagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173364
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31783

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugaccg ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173365
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31784

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173366
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALE31785

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173367
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31786

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173368
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31787

<400> 173368
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173369
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31788

<400> 173369

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173370
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31789

<400> 173370
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173371
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<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALE31790

<400> 173371
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173372
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31791

<400> 173372
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caccgccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173373
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<212> RNA
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hemagglutinin__InfluenzaA__ALE31792

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaucua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173374
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31793

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucagccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173375
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31794

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173376
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31795

<400> 173376
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173377
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31796

<400> 173377
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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<210> 173378
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31797

<400> 173378
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173379
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31798

<400> 173379
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173380
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173381
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31800

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagauccu gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173382
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31801

<400> 173382
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173383
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31802

<400> 173383
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173384
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31803

<400> 173384
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173385
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31805

<400> 173385
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173386
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31806

<400> 173386
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cacccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173387
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31807

<400> 173387

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acguguggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173388
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31808

<400> 173388
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173389
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31810

<400> 173389
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173390
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31812

<400> 173390
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173391
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31814

<400> 173391
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173392
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31815

<400> 173392
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173393
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31818

<400> 173393
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173394
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31819

<400> 173394
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa ggagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173395
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31820

<400> 173395
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173396
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31821

<400> 173396
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173397
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31822

<400> 173397
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaucua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173398
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE31823

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173399
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31824

<400> 173399
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173400
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31825

<400> 173400
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacagaua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173401
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31826

<400> 173401
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

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<210> 173402
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173403
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ALE31828

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173404
<211> 1701
<212> RNA
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173405
<211> 1701
<212> RNA
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<220>
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<400> 173405

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173406
<211> 1701
<212> RNA
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<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173407
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALE31833

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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<210> 173408
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALE31834

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173409
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31835

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<212> RNA
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hemagglutinin__InfluenzaA__ALE31836

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173411
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALE31837

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173412
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__ALE31838

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173413
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALE31839

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173414
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31840

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacu gagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173415
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31842

<400> 173415
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173416
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE31843

<400> 173416
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173417
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31844

<400> 173417
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173418
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 173418
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagagaugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173419
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173420
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173421
<211> 1701
<212> RNA
<213> Artificial Sequence

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagagugac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173422
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31851

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ucggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173423
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31852

<400> 173423

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173424
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31853

<400> 173424
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173425
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31854

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcagaugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173426
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<212> RNA
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hemagglutinin__InfluenzaA__ALE31855

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagauccu gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacagcaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173427
<211> 1701

<212> RNA
<213> Artificial Sequence

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173428
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173429
<211> 1701
<212> RNA
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<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173430
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31859

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaccag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga caugcugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173431
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31860

<400> 173431
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcgag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 173432
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31861

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173433
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALE31862

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgaguucc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173434
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173435
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31865

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173436
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31866

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173437
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31867

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa cggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173438
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31868

<400> 173438
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173439
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31869

<400> 173439
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa cggcaacauc 1680

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<210> 173440
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31870

<400> 173440
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<400> 173441

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aacagcagca ucggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173442
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 173442
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173443
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31873

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173444
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcgccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173445
<211> 1701

<212> RNA
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<220>
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ggcaacgaca acagcgccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173446
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31876

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173447
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31877

<400> 173447
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagauc 1380

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guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173448
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31878

<400> 173448
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173449
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31879

<400> 173449
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173450
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31880

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173451
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31881

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gguggccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173452
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173453
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31888

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173454
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31889

<400> 173454
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173455
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31890

<400> 173455
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173456
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31891

<400> 173456
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173457
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31892

<400> 173457
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173458
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31893

<400> 173458
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173459
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31894

<400> 173459

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagauccu gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173460
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31895

<400> 173460
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173461
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31896

<400> 173461
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173462
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31897

<400> 173462
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173463
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31898

<400> 173463
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173464
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31899

<400> 173464
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauga ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173465
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31901

<400> 173465
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagauccu gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173466
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173467
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALE31903

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173468
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31904

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173469
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31905

<400> 173469
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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173470
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE31906

<400> 173470
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173471
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31907

<400> 173471
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agagcggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173472
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31908

<400> 173472
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173473
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31909

<400> 173473
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agagcggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173474
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31910

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173475
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31912

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173476
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31913

<400> 173476
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173477
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31914

<400> 173477

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173478
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31915

<400> 173478
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173479
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31916

<400> 173479
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173480
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31917

<400> 173480
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173481
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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<400> 173481
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagagaugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173482
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31920

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173483
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31921

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173484
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31922

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173485
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31923

<400> 173485
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173486
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31924

<400> 173486
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173487
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31925

<400> 173487
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173488
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagggc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173489
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31927

<400> 173489
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173490
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31928

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173491
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31930

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaucua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173492
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31931

<400> 173492
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173493
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31932

<400> 173493
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173494
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31933

<400> 173494
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 173495
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31934

<400> 173495

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccaggcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacaucccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173496
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31935

<400> 173496
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173497
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALE31936

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuacagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173498
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALE31937

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173499
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31938

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173500
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31939

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173501
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31941

<400> 173501
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173502
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31943

<400> 173502
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

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agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173503
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31944

<400> 173503
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173504
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacgugg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg acaucgagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173505
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31946

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173506
<211> 1701
<212> RNA
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<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173507
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31948

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gugggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgaguucc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173508
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31949

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173509
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31950

<400> 173509
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173510
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31951

<400> 173510
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173511
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173512
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31953

<400> 173512
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uucgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173513
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31954

<400> 173513

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagagaugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaca gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacgugg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

gugggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173514
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31955

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173515
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31956

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173516
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31957

<400> 173516
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173517
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31958

<400> 173517
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcaagcc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173518
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31959

<400> 173518
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacgccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173519
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 173519
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173520
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31961

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173521
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31962

<400> 173521
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaugag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173522
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31963

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaccuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacaacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173523
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31964

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacua cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173524
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE31965

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173525
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31966

<400> 173525
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173526
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31967

<400> 173526
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173527
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31968

<400> 173527
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173528
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 173528
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173529
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173530
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31971

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacgccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173531
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31972

<400> 173531

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173532
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31973

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173533
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31974

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173534
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31975

<400> 173534
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173535
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31976

<400> 173535
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173536
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31977

<400> 173536
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173537
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31978

<400> 173537
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

auccacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173538
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31979

<400> 173538
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173539
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE31980

<400> 173539
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcgagua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173540
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31981

<400> 173540
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173541
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE31995

<400> 173541
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173542
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE31996

<400> 173542
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagagugac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguuca ucgagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173544
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<212> RNA
<213> Artificial Sequence

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173545
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<212> RNA
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccugc acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173546
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32000

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173547
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32001

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173548
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32002

<400> 173548
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173549
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32003

<400> 173549

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173550
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<212> RNA
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<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173552
<211> 1701
<212> RNA
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173553
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<212> RNA
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hemagglutinin__InfluenzaA__ALE32007

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173554
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32008

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaagg uggaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173555
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32009

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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg ugcugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173556
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32010

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccugc acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173557
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32011

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173558
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32012

<400> 173558
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173559
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32013

<400> 173559
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173560
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE32014

<400> 173560
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccagcuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173561
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32015

<400> 173561
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cacccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173562
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32016

<400> 173562
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173563
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32017

<400> 173563
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173564
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32018

<400> 173564
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173565
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE32020

<400> 173565
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173566
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173567
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 173567

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacgg caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173568
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173569
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32024

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagagaugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc aagagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaca gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcacc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acuacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173570
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 173570
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agagcggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173571
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32026

<400> 173571
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaugcaaca ucugcaucug a 1701

<210> 173572
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32027

<400> 173572
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 173573
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32028

<400> 173573
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173574
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<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173575
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32030

<400> 173575
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaucua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173576
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32031

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173577
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32032

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucgccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173578
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173579
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32034

<400> 173579
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173580
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32035

<400> 173580
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173581
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32036

<400> 173581
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccugc acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173582
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32037

<400> 173582
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagauccu gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173583
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca agggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccugaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173584
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32039

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173585
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32040

<400> 173585

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcacc 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173586
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32041

<400> 173586
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173587
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32042

<400> 173587
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173588
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32043

<400> 173588
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacaccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173589
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32044

<400> 173589
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173590
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32045

<400> 173590
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173591
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32046

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173592
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32047

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccagg ugcuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugaucagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccagcga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173593
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32048

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173594
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32049

<400> 173594
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173595
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32050

<400> 173595
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccaggacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173596
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE32051

<400> 173596
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagagugac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugauca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173597
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32052

<400> 173597
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173598
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32053

<400> 173598
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173599
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32054

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgagagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaacc acugcaucug a 1701

<210> 173600
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32055

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa cggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173601
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE32056

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173602
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32057

<400> 173602
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173603
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32058

<400> 173603

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173604
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32059

<400> 173604
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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hemagglutinin__InfluenzaA__ALE32060

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gguguuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

auccacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173606
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173607
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32062

<400> 173607
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucuacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173608
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32063

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173609
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32064

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173610
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32065

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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agaugcaaca ucugcaucug a 1701

<210> 173611
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32066

<400> 173611
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugagca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173612
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32067

<400> 173612
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuacagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

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<212> RNA
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173615
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgug 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173616
<211> 1701
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173617
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gagaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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agaugcaaca ucugcaucug a 1701

<210> 173618
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32073

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 173619
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<210> 173620
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32075

<400> 173620
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

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agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173622
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggcccac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173623
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173624
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173625
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173626
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32081

<400> 173626
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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 173627
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32082

<400> 173627
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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 173628
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32083

<400> 173628
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagagaac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173629
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173630
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALE32085

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173631
<211> 1701
<212> RNA
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc agcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173632
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173633
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32088

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcugcac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173634
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32089

<400> 173634
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173635
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32090

<400> 173635
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173636
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32091

<400> 173636
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173637
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca gaagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgagc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173638
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32093

<400> 173638
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagauccu gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173639
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32094

<400> 173639

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaccagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173640
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32095

<400> 173640
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173641
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32096

<400> 173641
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga gcuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173642
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32097

<400> 173642
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173643
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32099

<400> 173643
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173644
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32100

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgaccugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173645
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32101

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agccagugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

ggcagcuucu ucagcagacu gaacuggcug acccaccuga aguacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173646
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32102

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugagca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173647
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32103

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcaagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173648
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32104

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173649
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32105

<400> 173649
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173650
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALE32106

<400> 173650
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173651
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32107

<400> 173651
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcaagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173652
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32108

<400> 173652
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ggcaacgaca acagcgccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173653
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32109

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aucgugaaga ccaucaccag cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccacagca acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173654
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32110

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173655
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173656
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32112

<400> 173656
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacgccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173657
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALE32113

<400> 173657

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaugag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173658
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32114

<400> 173658
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173659
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32115

<400> 173659
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaagg gcagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173660
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32116

<400> 173660
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacgug 1680

agaugcaaca ucugcaucug a 1701

<210> 173661
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32117

<400> 173661
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgacuuca agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcgagua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173662
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALE32118

<400> 173662
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagauccu gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173663
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALM06086

<400> 173663
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173664
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALM06087

<400> 173664
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173665
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALM06088

<400> 173665
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173666
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALM06089

<400> 173666
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173667
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39661

<400> 173667
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcaucgcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173668
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagagaugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucca gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaagg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173669
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39663

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173670
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173671
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALN39665

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173672
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39666

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173673
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39667

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugacc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagaaacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173674
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39668

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173675
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ALN39669

<400> 173675

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ugagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173676
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39670

<400> 173676
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173677
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39671

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173678
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39672

<400> 173678
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173679
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39673

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccgacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173680
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39674

<400> 173680
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

aucgagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173681
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39675

<400> 173681
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173682
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39676

<400> 173682
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucagaaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca gagcgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173683
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39677

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacgccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173684
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173685
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39679

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173686
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ALN39680

<400> 173686
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173687
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39681

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173688
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39682

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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173689
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39683

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173690
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39684

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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173691
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<220>
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hemagglutinin__InfluenzaA__ALN39685

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173692
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacaccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173693
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__ALN39687

<400> 173693

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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173694
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaucua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173695
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39689

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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

auccacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173696
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39690

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173697
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39691

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cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaugcaaca ucugcaucug a 1701

<210> 173698
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39692

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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

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hemagglutinin__InfluenzaA__ALN39693

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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hemagglutinin__InfluenzaA__ALN39694

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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hemagglutinin__InfluenzaA__ALN39695

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173702
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39696

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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173703
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hemagglutinin__InfluenzaA__ALN39697

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173704
<211> 1701
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<213> Artificial Sequence

<220>
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acaacgugua cagaaacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173705
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39700

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aagugcaaca ucugcaucug a 1701

<210> 173706
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39701

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<212> RNA
<213> Artificial Sequence

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcagca ucugcaucug a 1701

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<211> 1701
<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173709
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173710
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173711
<211> 1701
<212> RNA
<213> Artificial Sequence

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<400> 173711

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173712
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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<210> 173713
<211> 1701
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<220>
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hemagglutinin__InfluenzaA__ALN39708

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173714
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39709

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaugag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugacc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

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<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcaagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcgag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173716
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagauccu gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173717
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39712

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173718
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39713

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173719
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39714

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaccuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173720
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39715

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173721
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39716

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173722
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 173722
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173723
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39718

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcgagua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173724
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39734

<400> 173724
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173725
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39735

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccga cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173726
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39736

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aggcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccaga accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173727
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39737

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173728
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39738

<400> 173728
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173729
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39739

<400> 173729

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccacaaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccugg acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173730
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39740

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugaccg ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgccagaa gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuacagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173731
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39741

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173732
<211> 1701
<212> RNA
<213> Artificial Sequence

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgac 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173733
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aaagagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaucua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173734
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173735
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39745

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173736
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39746

<400> 173736
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173737
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39747

<400> 173737
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga aguacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173738
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39748

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacgccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagauccu gagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173739
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALN39749

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173740
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173741
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALN39789

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173742
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALO75895

<400> 173742
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcagacu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagacc cugaucaucc ccaagagcag cuggcccaac 420

cacaccagca gcggcgugag cgccgccugc cccuaccagg gcaugcccag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacgac gccuacccca ccaucaagau gagcuacaac 540

aacaccuaca gagaggaccu gcugauccug uggggcaucc accacagcaa caacgccgcc 600

gagcagacca accuguacaa gaaccccacc accuacguga gcgugggcac cagcacccug 660

aaccagagac uggagcccaa gaucgccacc agaagccagg ugaacggcca gagaggcaga 720

auggacuucu ucuggaccau ccugaagccc aacgacgcca uccacuucga gagcaacggc 780

aacuucaucg cccccgagua cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgaga uggaguacgg ccacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

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augguggacg gcugguacgg cuaccaccac agcaacgagc agggcagcgg cuacgccgcc 1140

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cuggcccugg ccaucaucgu ggccggccug agccugugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173743
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALO75907

<400> 173743
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcugguu ccugggcaac 240

agaaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagacc cugaucaucc ccaagagcag cuggcccaac 420

cacaccagca gcggcgugag cgccgccugc cccuaccagg gcaugcccag cuucuucaga 480

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gagcagacca accuguacaa gaaccccacc accuacguga gcgugggcac cagcacccug 660

aaccagagac uggagcccaa gaucgccacc agaagccagg ugaacggcca gagaggcaga 720

auggacuucu ucuggaccau ccugaagccc aacgacgcca uccacuucga gagcaacggc 780

aacuucaucg cccccgagua cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgaga uggaguacgg ccacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acaagcuggu gcuggccacc ggccugagaa acagcccccu gagagagaga 1020

agaagaaaga gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggcagggc 1080

augguggacg gcugguacgg cuaccaccac agcaacgagc agggcagcgg cuacgccgcc 1140

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cuggcccugg ccaucaucgu ggccggccug agccugugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173744
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALO75919

<400> 173744
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcacggcaac 240

agaaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagacc cugaucaucc ccaagagcag cuggcccaac 420

cacaccagca gcggcgugag cgccgccugc cccuaccagg gcaugcccag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacgac gccuacccca ccaucaagau gagcuacaac 540

aacaccuaca gagaggaccu gcugauccug uggggcaucc accacagcaa caacgccgcc 600

gagcagacca accuguacaa gaaccccacc accuacguga gcgugggcac cagcacccug 660

aaccagagac uggagcccaa gaucgccacc agaagccagg ugaacggcca gagaggcaga 720

auggacuucu ucuggaccau ccugaagccc aacgacgcca uccacuucga gagcaacggc 780

aacuucaucg cccccgagua cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgaga uggaguacgg ccacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acaagcuggu gcuggccacc ggccugagaa acagcccccu gagagagaga 1020

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augguggacg gcugguacgg cuaccaccac agcaacgagc agggcagcgg cuacgccgcc 1140

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cuggcccugg ccaucaucgu ggccggccug agccugugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173745
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ALT20080

<400> 173745
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aucugcaucg gcuaccagag caccaacagc accgagaccg uggacacccu gaccgagaac 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gagccuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acgacggcac cagcaccgcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugacca gaaagaacgg cgacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu ucggccacau ccugagcggc gagagccacg gcagaauccu gaagaccaac 840

cugaagagag gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccuggguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

aagagagccc ugggcagcaa cgccguggag gacggcaagg gcugcuucga gcuguaccac 1440

aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 173746
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ALT66860

<400> 173746
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaaccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173747
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AMA65391

<400> 173747

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaaccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg ugguguuccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173748
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaaccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagccccgu ggccagcagc 1620

cuggugcugg ugguguuccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173749
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAA02768

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aacugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag gagagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccaa gggcgugacc gccagcugca gccacaacgg caagagcagc 480

uucuacagaa accugcugug gcugaccggc aagaacggcc uguaccccaa ccugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucggcg accagagagc caucuaccac accgagaacg ccuacgugag cguggugagc 660

agccacuaca gcagaagauu cacccccgag aucgccaaga gacccaaggu gagaggccag 720

gagggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcauggac gagugcgacg ccaagugcca gaccccccag 900

ggcgccauca acagcagccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcuacggc 1440

ugcuucgagu ucuaccacaa gugcaacaac gagugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173750
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAA02769

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aacugcagca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucagcaag gagagcugga gcuacaucgc cgagaccccc 300

aacagcgaga acggcaccug cuaccccggc uacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccaa gggcgugacc gccagcugca gccacaacgg caagagcagc 480

uucuacagaa accugcugug gcugaccggc aagaacggcc uguaccccaa ccugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcgugca ccaccccagc 600

aacaucagag accagagagc caucuaccac accgagaacg ccuacgugag cguggugagc 660

agccacuaca gcagaagauu cacccccgag aucgccaaga gacccaaggu gagagaccag 720

gagggcagaa ucaacuacua cuggacccug cuggagcccg gcgacaccau caucuucgag 780

gccaacggca accugaucgc ccccugguac gccuucgccc ugagcagagg cuucggcagc 840

ggcaucauca ccagcaacgc cagcauggac gagugcgacg ccaagugcca gacccccccag 900

ggcgccauca acagcagccu gcccuuccag aacgugcacc ccgugaccau cggcgagugc 960

cccaaguacg ugagaagcac caagcugaga auggugaagg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaugggcgu guaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173751
<211> 1689

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAC43764

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gugacccacg ccaagaacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugau cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

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cagaucaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca cccccgagau cgccaccaga cccaagguga acggccuggg cagcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

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ugguacggcu accaccacag caacgaccag ggcagcggcu acgccgccga caaggagagc 1140

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acccaguucg aggccguggg caaggaguuc agcaaccugg agagaagacu ggagaaccug 1260

aacaagaaga uggaggacgg cuuccuggac guguggaccu acaacgccga gcugcuggug 1320

cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca guucagaauc 1680

ugcaucuga 1689

<210> 173752
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAE07201

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagaacggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

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cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173753
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAH95823

<400> 173753
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaagcacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173754
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAH95824

<400> 173754
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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<212> RNA
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hemagglutinin__InfluenzaA__BAJ07997

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

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<210> 173756
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__BAJ39949

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173757
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ39950

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgc cgagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173758
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 173758
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173759
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39952

<400> 173759
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173760
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39953

<400> 173760
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173761
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39954

<400> 173761
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173762
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39955

<400> 173762
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agcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

aucagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcaaga ucugcaucug a 1701

<210> 173763
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39956

<400> 173763
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgc cgagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173764
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39957

<400> 173764
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173765
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39958

<400> 173765

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag caaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173766
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__BAJ39959

<400> 173766
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccuuc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag caaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173767
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39960

<400> 173767
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173768
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39961

<400> 173768
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173769
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ39962

<400> 173769
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgc cgagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaccug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccuuc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag caaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173770
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ39963

<400> 173770
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173771
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ39964

<400> 173771
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173772
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ39965

<400> 173772
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173773
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39966

<400> 173773
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173774
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39967

<400> 173774
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173775
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39968

<400> 173775
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacgagaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173776
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__BAJ39969

<400> 173776
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173777
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ39970

<400> 173777
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173778
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__BAJ39971

<400> 173778
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173779
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ39972

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173780
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ39973

<400> 173780
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173781
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 173781
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 173782
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39975

<400> 173782
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 173783
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39976

<400> 173783

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacgagaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc aacuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173784
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 173784
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173785
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39978

<400> 173785
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagagcag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccaca gcaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173786
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39979

<400> 173786
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa uggacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaacaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173787
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39980

<400> 173787
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173788
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39981

<400> 173788
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

agcaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag caaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173789
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39982

<400> 173789
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acacccugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173790
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39983

<400> 173790
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgc cgagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173791
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39984

<400> 173791
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173792
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39985

<400> 173792
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173793
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39987

<400> 173793
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag caaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173794
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__BAJ39988

<400> 173794
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag caucuaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

agcaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173795
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39989

<400> 173795
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaacgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173796
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39990

<400> 173796
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173797
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39993

<400> 173797
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173798
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39994

<400> 173798
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaccaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173799
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ39996

<400> 173799
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173800
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<212> RNA
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hemagglutinin__InfluenzaA__BAJ39997

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaccaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

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<400> 173801

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

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hemagglutinin__InfluenzaA__BAJ39999

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173803
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<212> RNA
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hemagglutinin__InfluenzaA__BAJ40000

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173804
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__BAJ40001

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173805
<211> 1701

<212> RNA
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<220>
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hemagglutinin__InfluenzaA__BAJ40002

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 173806
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__BAJ40003

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173807
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40004

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgagacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugaa gagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173808
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40006

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg cagagaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 173809
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40007

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 173810
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<212> RNA
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hemagglutinin__InfluenzaA__BAJ40008

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173811
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40009

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa uggacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173812
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcaucug a 1701

<210> 173813
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__BAJ40011

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcaucug a 1701

<210> 173814
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__BAJ40012

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcauc 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 173817
<211> 1701
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hemagglutinin__InfluenzaA__BAJ40015

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaacac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 173818
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 173819
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<400> 173819

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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<210> 173820
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<212> RNA
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<210> 173821
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<210> 173822
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hemagglutinin__InfluenzaA__BAJ40020

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 173823
<211> 1701

<212> RNA
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hemagglutinin__InfluenzaA__BAJ40021

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgagacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 173824
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__BAJ40023

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173825
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__BAJ40024

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173826
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__BAJ40025

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 173827
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40026

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 173828
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__BAJ40027

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgagacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 173829
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__BAJ40028

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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cagugcagaa ucugcaucug a 1701

<210> 173830
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

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<210> 173831
<211> 1701
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hemagglutinin__InfluenzaA__BAJ40030

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugaaggag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg cagagaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 173832
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 173833
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hemagglutinin__InfluenzaA__BAJ40032

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

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accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cagugcagaa ucugcaucug a 1701

<210> 173834
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__BAJ40033

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugaaggag 360

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accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

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<210> 173835
<211> 1701
<212> RNA
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hemagglutinin__InfluenzaA__BAJ40034

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

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<210> 173836
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40035

<400> 173836
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<210> 173837
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__BAJ40036

<400> 173837

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cagugcagaa ucugcaucug a 1701

<210> 173838
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40037

<400> 173838
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173839
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40038

<400> 173839
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggaccauc guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173840
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40039

<400> 173840
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173841
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40040

<400> 173841
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg cagagaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcuac 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173842
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40041

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173843
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40042

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugaaggag 360

ccccugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg cagagaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg acagacagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173844
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40043

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173845
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40044

<400> 173845
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcagaaggag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagaucaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173846
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40045

<400> 173846
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg cagagaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173847
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40046

<400> 173847
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc agaugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aucagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugaaggag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaag 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

aagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173848
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__BAJ40047

<400> 173848
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugaaggag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg cagagaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173849
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40048

<400> 173849
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagagaaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173850
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40050

<400> 173850
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugaaggag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173851
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40051

<400> 173851
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173852
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40052

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg cagagaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173853
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__BAJ40053

<400> 173853
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173854
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40054

<400> 173854
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173855
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40055

<400> 173855

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcaccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaucugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

gugcagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173856
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40056

<400> 173856
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagcugcu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcaggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagacac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac aacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagccc caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173857
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40057

<400> 173857
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagagaaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173858
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__BAJ40058

<400> 173858
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173859
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40059

<400> 173859
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173860
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40060

<400> 173860
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173861
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40061

<400> 173861
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173862
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40062

<400> 173862
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaag 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcaaga ucugcaucug a 1701

<210> 173863
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40063

<400> 173863
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173864
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAJ40064

<400> 173864
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173865
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAK23398

<400> 173865
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgugaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucuucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcuggu gaagaaggac aacgccuacc ccaccaucaa gaagagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaaucgagu ucuucuggac cauccugaag agcaacgacg ugaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc cagaggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

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ggcaccuacg acuacccccа guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

ggcgugaagc uggagagcau cggcaccuac cagauccuga gcaucuacag caccguggcc 1620

agcagccugg cccuggccau caugauggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173866
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
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<400> 173866
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccacaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcagcagacu ggugcuggcc accggccuga gaaacagccc ccagggcaag 1020

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cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagagagcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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ggcaccuacg acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

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agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173867
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAK23401

<400> 173867
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugagc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacaacu acgaggagcu gaagcaccug 360

cugagcagaa ucaacagauu cgagaagauc cagaucaucc ccaagagcag cuggcccgac 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcggccc cagcuucuac 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaucaucaa gaagagcuac 540

cacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgag 600

gaggagcaga ccagaaucua caagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaguggagu ucuucuggac cauccugaag agcaacgaca ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

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cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

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aucaucgaca agaugaacau ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173868
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAK23402

<400> 173868
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcaac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gaucagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacacc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccacggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

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aacggcugcu ucgaguucua ccacagaugc gacaacgagu gcauggagag cgugagaaac 1500

ggcaccuacg acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

ggcgugaagc uggagagcau cggcaccuac cagauccuga gcaucuacag caccguggcc 1620

agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173869
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAK23403

<400> 173869
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcaac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gaucagcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacagaugc gacaacgagu gcauggagag cgugagaaac 1500

ggcaccuacg acuacccccа guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

ggcgugaagc uggagagcau cggcaccuac cagauccuga gcaucuacag caccguggcc 1620

agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173870
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAK23404

<400> 173870
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacagaugc gacaacgagu gcauggagag cgugagaaac 1500

ggcaccuacg acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

ggcgugaagc uggagagcau cggcaccuac cagauccuga gcaucuacag caccguggcc 1620

agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173871
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAK23405

<400> 173871
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacagaugc gacaacgagu gcauggagag cgugagaaac 1500

ggcaccuacg acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

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agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173872
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAK23406

<400> 173872
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgugaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucuucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcuggu gaagaaggac aacgccuacc ccaccaucaa gaagagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaaucgagu ucuucuggac cauccugaag agcaacgacg ugaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacagaugc gacaacgagu gcauggagag cgugaagaac 1500

ggcaccuacg acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

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agcagccugg cccuggccau caugauggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173873
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAK23407

<400> 173873

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugagc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacaacu acgaggagcu gaagcaccug 360

cugagcagaa ucaacagauu cgagaagauc cagaucaucc ccaagagcag cuggcccgac 420

cacgaggcca gccugggcgu gagcgccgcc ugccccuacc agggcggccc cagcuucuac 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucga gaagagcuac 540

cacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgag 600

gccgagcaga ccagaaucua caagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaguggagu ucuucuggac cauccugaag agcaacgaca ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccagau gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

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ggcaccuacg acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

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agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173874
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAK23408

<400> 173874
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccc caacgugagc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacaacu acgaggagcu gaagcaccug 360

cugagcagaa ucaacagauu cgagaagauc cagaucaucc ccaagagcag cuggcccgac 420

cacgaggcca gccugggcgu gagcagcgcc ugccaguacc agggcggccc cagcuucuac 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gaagagcuac 540

cacaacacca acaaggagga ccugcuggug cugugggca uccaccaccc caacaacgag 600

gaggagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaguggagu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacuac aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

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cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca aggaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173875
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAK23411

<400> 173875
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugagc gaguggagcu acaucgugga gaagaucaac 300

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cacgaggcca gccugggcgu gagcagcgcc ugccaguacc agggcggccc cagcuucuac 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gaagagcuac 540

cacaacacca acaaggagga ccugcuggug cugugggca uccaccaccc caacaacgag 600

gaggagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

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agaguggagu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

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aucaucgaca agaugaacac ccaguucgag gccgugggca aggaguucaa caaccuggag 1260

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agccugcagu gcagaaucug caucuga 1707

<210> 173876
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAK23412

<400> 173876
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca agggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugagc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacaacu acgaggagcu gaagcaccug 360

cugagcagaa ucaacagauu cgagaagauc cagaucaucc ccaagagcag cuggcccgac 420

cacgaggcca gccugggcgu gagcagcgcc ugccaguacc agggcggccc cagcuucuac 480

agaaacgugg uguggcugau caagaaggac aacaccuacc ccaccaucaa gaagagcuac 540

cacaacacca acaaggagga ccugcuggug cugugggggca uccaccaccc caacaacgag 600

gaggagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaguggagu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca aggaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacagaugc gacaacgagu gcauggagag cgugagaaac 1500

ggcaccuacg acuacccccа guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

ggcgugaagc uggagagcac cggcaccuac cagauccuga gcaucuacag caccguggcc 1620

agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173877
<211> 1707

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAK23413

<400> 173877
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugagc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacaacu acgaggagcu gaagcaccug 360

cugagcagaa ucaacagauu cgagaagauc cagaucaucc ccaagagcag cuggcccgac 420

cacgaggcca gccugggcgu gagcagcgcc ugccaguacc agggcggccc cagcuucuac 480

agaaacgugg uguggcugau caagaaggac aacaccuacc ccaccaucaa gaagagcuac 540

cacaacacca acaaggagga ccugcuggug cugugggca uccaccaccc caacaacgag 600

gaggagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaguggagu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca aggaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

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ggcaccuacg acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

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agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173878
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAK23414

<400> 173878
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugagc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacaacu acgaggagcu gaagcaccug 360

cugagcagaa ucaacagauu cgagaagauc cagaucaucc ccaagagcag cuggcccgac 420

cacgaggcca gccugggcgu gagcagcgcc ugccaguacc agggcggccc cagcuucuac 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gaagagcuac 540

cacaacacca acaaggagga ccugcuggug cugugggca uccaccaccc caacaacgag 600

gaggagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaguggagu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca aggaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

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ggcaccuacg acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

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agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173879
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAM65746

<400> 173879
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acacccugcc cgagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaccc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaga gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaucug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgccaccgg cgugagcgcc agcugcagcc acaacggcaa gagcagcuuc 480

uacaagaacc ugcuguggcu gaccgugaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca ccccaccaac 600

aucggcgacc agagagcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaagauucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucaaga gcaacgcccc cauggacgag ugcaacgcca agugccagac cccccagggc 900

gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcaccaa gcugagaaug gugaccggcc ugagaaacac ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccguggac aaggaguuca acaagcugga gagaagaaug 1260

gagaacuuca acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcugaucc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagcaug 1620

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ugcagaaucu gcaucuga 1698

<210> 173880
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__BAO79716

<400> 173880
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcaacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca gagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca gagcgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173881
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
Hemagglutinin__InfluenzaA__CAB95856

<400> 173881
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aucugcaucg gccaccagag caccaacagc accgagaccg uggacacccu gaccgagacc 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccaccc ccugauccug gacaccugca ccaucgaggg ccugguguac 240

ggcaacccca gcugcgaccu gcugcugggc ggcagagagu ggagcuacau cguggagaga 300

agcagcgccg ugaacggcac cugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

acccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaccugg 420

aacgugaccu acaccggcac cagcagagcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagagcgg cuucuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagagca uccuguucgu gugggcauc caccaccccc ccaccuacac cgagcagacc 600

aaccuguaca ucagaaacga caccaccacc agcgugacca ccgaggaccu gaacagaacc 660

uucaagcccg ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacgu gcugagcggc ggcagccacg gcagaauccu gaagaccgac 840

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cugcccuucc acaacaucag caaguacgcc uucggcaccu gccccaagua cgugagagug 960

aacagccuga agcuggccgu gggccugaga aacgugcccg ccagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggcccg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacgugugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagagagccc ugggcagcaa cgccauggag gacggcaagg gcugcuucga gcuguaccac 1440

aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

agagaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugcu ggccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 173882
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
Hemagglutinin__InfluenzaA__CAB95857

<400> 173882
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aucugcaucg gccaccagag caccaacagc accgagaccg uggacacccu gaccgagacc 120

aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

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acccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaccugg 420

aacgugaccu acaccggcac cagcagagcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagagcgg cuucuacccc gugcaggacg cccaguacac caacaacaga 540

ggcaagagca uccuguucgu gugggcauc caccaccccc ccaccuacac cgagcagacc 600

aaccuguaca ucagaaacga caccaccacc agcgugacca ccgaggaccu gaacagaacc 660

uucaagcccg ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacgu gcugagcggc ggcagccacg gcagaauccu gaagaccgac 840

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cugcccuucc acaacaucag caaguacgcc uucggcaccu gccccaagua cgugagagug 960

aacagccuga agcuggccgu gggccugaga aacgugcccg ccagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacgugugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

agagaggaga gcagacugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

gccuacaaga uccugaccau cuacagcacc guggccagca gccuggugcu ggccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 173883
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__CBW54815

<400> 173883
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccc caacgugagc gaguggagcu acaucgugga gaagaccaac 300

cccgccaacg accugugcua ccccggcaac uucgacaacu acgaggagcu gaagcaccug 360

cugagcagaa ucaacagauu cgagaagauc cagaucaucc ccaagagcag cuggcccgac 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcggccc cagcuucuac 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa ggagagcuac 540

cacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgag 600

gaggagcaga ccagaaucua caagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaguggagu ucuucuggac cauccugaag agcaacgaca ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc agcaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

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cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

aagagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agccugcagu gcagaaucug caucuga 1707

<210> 173884
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__CBW54817

<400> 173884
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccc caacgugagc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacaacu acgaggagcu gaagcaccug 360

cugagcagaa ucaacagauu cgagaagauc cagaucaucc ccaagagcag cuggcccgac 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agagaggccc cagcuucuac 480

agaaacgugg uguggcugau caagaagaac gacaccuacc ccaccaucaa ggagagcuac 540

cacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgag 600

gaggagcaga agagaaucua caagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaguggagu ucuucuggac cauccugaag agcaacgaca ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc agcaccaagu gccagacccc caucggcgcc 900

aucaacacca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

ggcagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

aagagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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gugagaaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

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ggcaccuacg acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

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agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

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<212> RNA
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hemagglutinin__InfluenzaA__CBW54818

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccc caacgugagc gaguggagcu acaucgugga gaagaccaac 300

cccgccaacg accugugcua ccccggcaac uucaacaacu acgaggagcu gaagcaccug 360

cugagcagaa ucaacagauu cgagaagauc aagaucaucc ccaagagcag cuggcccgac 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcggccc cagcuucuac 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa ggagagcuac 540

cacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgag 600

gaggagcaga ccagaaucua caagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaguggagu ucuucuggac cauccugaag agcaacgaca ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc agcaccaagu gccagacccc cgugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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ggcagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca gagagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

aagagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agcagccugg cccuggccau caucguggcc ggccugcugc uguggaugug cagcaacggc 1680

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<210> 173886
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__CCG47908

<400> 173886
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cuggugaaga ccaucaccga cgaccagauc gaggugacca acgccaccga gcuggugcag 180

aacuucagca ugggcaagau cugcaagaac ccccacagaa uccuggacgg cgccaacugc 240

acccugaucg acagccugcu gggcgacccc cacugcgacg gcuuccagga cgagaagugg 300

gaccuguuca ucgagagaag caaggccuuc agcaacugcu accccuacga cgugcccgag 360

uacaccagcc ugagaagcau caucgccagc agcggcaccc uggaguucac caacgaggac 420

uucaacugga ccggcgugac ccagaacggc ggcagcagcg ccugcaagag aggccccaac 480

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agcaccaaga gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

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ugccccaagu acaucaagca gaacacccug aagcuggcca ccggcaugag aaacaucccc 1020

gagagacaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugguga acggcuggua cggcuucaga caccagaaca gcgagggcau cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagag auacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgagua cagagacgag gccgugaaca acagauucca gaucaagagc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 173887
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugggcggca ucgccccccu gcaccugggc aagugcaaca ucgccggcag acugcugggc 240

aaccccgagu gcgagcugcu gcugaccgug agcagcugga gcuacaucgu ggagaccagc 300

aagagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aaggagaaca gcuaccccaa gcugagcaag 540

agcuacguga acaacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acagaaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugagcuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca ugaacagagg cagcggcagc 840

ggcaucauca ucugggacgc ccccgugcac gacugcaaca ccaagugcca gacccccaag 900

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cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 173888
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__AAA43178

<400> 173888
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agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caccgagggc 420

uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccggc 480

agcggcuucu ucagcagacu gaacuggcug accaagagcg gcagcaccua ccccgugcug 540

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agcaccagaa gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucaguggg ccugccagag aggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173889
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AAA43185

<400> 173889
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gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

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gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

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acccaguucg aggccguggg caaggaguuc ggcaaccugg agagaagacu ggagaaccug 1260

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uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

aucaugaugg ccggcaucag cuucuggaug ugcagcaacg gcagccugca gugcagaauc 1680

ugcaucuga 1689

<210> 173890
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AAA43187

<400> 173890
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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acgccaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 173891
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AAA43209

<400> 173891

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guggccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucaccggcug gcugcugggc 240

aaccccgagu gcgacagccu gcugcccgcc agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcgccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag ccuggagaga uucgagaucu uccccaagga gagcagcugg 420

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

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gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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<210> 173892
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AAC40998

<400> 173892
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agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

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ggcaacgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agaaagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacauc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccagccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcgaggug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau ccugagcagc 900

cugcccuucc agaacaucaa cagcagaacc gugggcgagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccuggu ggacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaucca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 173893
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AAC40999

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacgugcc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcgacgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacauc 540

agaaaggacc ccgcccugau caucuggggc auccaccaca gcggcagcac cgccgagcag 600

accaagcugu acggcagcgg caacaagcug aucaccgugg gcagcagcaa cuaccagcag 660

agcuucgugc ccauccccgg cgccagaccc caggugaacg gccagagcgg cagaaucgac 720

uuccacuggc ugaugcugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcgaggug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau ccugaacaac 900

cugcccuucc agaacaucaa cggcagagcc gugggcaagu gccccagaua cgugaagcag 960

gagagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccuggu ggacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

caguucgagc ugaucgacaa cgaguucacc gagguggaga agcagaucgg caacgugauc 1260

aacuggacca gagacagcau gaccgaggug uggagcuaca acgccgagcu gcugguggcc 1320

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gugagaagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaucca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gccaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 173894
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACA28844

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcgacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cagauacgcc uucgcccuga gcagaggcuu cggcagcggc 840

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gccaucaaca gcagccugcc cuuccagaac gugcaccccg ugaccaucgg cgagugcccc 960

aaguacguga gaagcgccaa gcugagaaug gugaccggcc ugagaaacau ccccagcauc 1020

cagagcagag gccuguucgg cgccaucgcc ggcuucaucg agggcggcug gaccggcaug 1080

guggacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacag cgugaucgag 1200

aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uucaucgaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

cuggagagca ugggcgugua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

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ugcagaaucu gcaucuga 1698

<210> 173895
<211> 1698

<212> RNA
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hemagglutinin__InfluenzaA__ACA28844/m1

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gugaccguga cccacagcgu gaaccugcug gagaacagcc acaacggcaa gcugugccug 180

cugaagggca ucgccccccu gcagcugggc aacugcagcg uggccggcug gauccugggc 240

aaccccgagu gcgagcugcu gaucagcaag gagagcugga gcuacaucgu ggagaagccc 300

aaccccgaga acggcaccug cuaccccggc cacuucgccg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca ccgugaccgg cgugagcgcc agcugcagcc acaacggcga gagcagcuuc 480

uacagaaacc ugcuguggcu gaccggcaag aacggccugu accccaaccu gagcaagagc 540

uacgccaaca acaaggagaa ggaggugcug gugcuguggg gcgugcacca cccccccaac 600

aucggcaacc agaaggcccu guaccacacc gagaacgccu acgugagcgu ggugagcagc 660

cacuacagca gaaaguucac ccccgagauc gccaagagac ccaaggugag agaccaggag 720

ggcagaauca acuacuacug gacccugcug gagcccggcg acaccaucau cuucgaggcc 780

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aagaugaaca cccaguucac cgccgugggc aaggaguuca acaagcugga gagaagaaug 1260

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cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug caacgacgag ugcauggaga gcgugaagaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaagaucga cggcgugaag 1560

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ugcagaaucu gcaucuga 1698

<210> 173896
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV82259

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaccuu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173897
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ACV82259/m1

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaccuu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173898
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV82259/m2

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcgacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaccuu caagcccgag aucgccauca gacccaaggu gagagacaga 720

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173899
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACP41953

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173900
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM72832

<400> 173900
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__EPI731463

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaacac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__EPI696972

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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hemagglutinin__InfluenzaA__EPI662594

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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<210> 173906
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hemagglutinin__InfluenzaA__EPI685579

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

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<210> 173907
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__EPI830230

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaaccag 540

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accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagauguu caagcccgag aucgccacca gacccaaggu gagagacaga 720

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gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173908
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACQ45338

<400> 173908
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173909
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACQ45338/m1

<400> 173909

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173910
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACQ45338/m2

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173911
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACU79871

<400> 173911
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccga cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg uguuccagaa cgagaccugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucau caccgagggc 420

uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccggc 480

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aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccagaa gaagccagca gaccaucauc cccaacaucg gcagcagacc cugggugaga 720

ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac cagaagacag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagag aggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173912
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACU79871/m1

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

cuggugaaga ccaucaccga cgaccagauc gaggugacca acgccaccga gcuggugcag 180

agcagcagca ccggcaagau cugcaacaac ccccacagaa uccuggacgg caucgacugc 240

acccugaucg acgcccugcu gggcgacccc cacugcgacg uguuccagaa cgagaccugg 300

gaccuguucg uggagagaag caaggccuuc agcaacugcu accccuacga cgugcccgac 360

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uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccggc 480

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aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

cccagcacca accaggagca gaccagccug uacgugcagg ccagcggcag agugaccgug 660

agcaccagaa gaagccagca gaccaucauc cccaacaucg agagcagacc cugggugaga 720

ggccagagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaaggu gaacagaauc 1200

aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaagcggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggugcu gcugggcuuc aucauguggg ccugccagag aggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173913
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI643118

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuucccc uacgcccaga gcagcggcag aaucaucgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagcugag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173914
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI675798

<400> 173914
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173915
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI578430

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcagcugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuucccc uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucaugugggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173916
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI614406

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcagcugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuucccc uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173917
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACU65077/m1

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

accagaggcc uguucggcgc caucgccggc uucaucgagg gcggcuggca gggcauggug 1080

gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

gagagcaccc agaaggccau cgacggcgug accaacaagg ugaacagcau caucgacaag 1200

augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

aaccugaaca agaagaugga ggacggcuuc cuggacgugu ggaccuacaa cgccgagcug 1320

cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

uacgacaagg ugagacugca gcugagagac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 173918
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACU65077/m2

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

accagaggcc uguucggcgc caucgccggc uucaucgagg gcggcuggca gggcauggug 1080

gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

gagagcaccc agaaggccau cgacggcgug accaacaagg ugaacagcau caucgacaag 1200

augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

aaccugaaca agaagaugga ggacggcuuc cuggacgugu ggaccuacaa cgccgagcug 1320

cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

uacgacaagg ugagacugca gcugagagac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 173919
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ABP51976

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcaccuacc ccaccaucaa gagaagcuac 540

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gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173920
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 173921
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABW90125

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagaagcaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

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cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcua cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugac caagaagaac agcaccuacc ccaccaucaa gagaagcuac 540

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cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

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gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

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augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

aaccugaaca agaagaugga ggacggcuuc cuggacgugu ggaccuacaa cgccgagcug 1320

cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

uacgacaagg ugagacugca gcugagagac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 173922
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABW90126

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accgugaccc acgcccagga cauccuggag aagaagcaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

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cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcaccuacc ccaccaucaa gggcagcuac 540

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cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

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gagagcaccc agaaggccau cgacggcgug accaacaagg ugaacagcau caucgacaag 1200

augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

aaccugaaca agaagaugga ggacggcuuc cuggacgugu ggaccuacaa cgccgagcug 1320

cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

uacgacaagg ugagacugca gcugagagac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 173923
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABW90127

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accgugaccc acgcccagga cauccuggag aagaagcaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

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cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcgagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

accagaggcc uguucggcgc caucgccggc uucaucgagg gcggcuggca gggcauggug 1080

gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

gagagcaccc agaaggccau cgacggcgug accaacaagg ugaacagcau caucgacaag 1200

augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

aaccugaaca agaagaugga ggacggcuuc cuggacgugu ggaccuacaa cgccgagcug 1320

cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

uacgacaagg ugagacugca gcugagagac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 173924
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABW90128

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accgugaccc acgcccagga cauccuggag aagaagcaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau cgagaagaac agcaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

accagaggcc uguucggcgc caucgccggc uucaucgagg gcggcuggca gggcauggug 1080

gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

gagagcaccc agaaggccau cgacggcgug accaacaagg ugaacagcau caucgacaag 1200

augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

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cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

uacgacaagg ugagacugca gcugagagac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 173925
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<212> RNA
<213> Artificial Sequence

<220>
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accgugaccc acgcccagga cauccuggag aagaagcaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccgagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

accagaggcc uguucggcgc caucgccggc uucaucgagg gcggcuggca gggcauggug 1080

gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

gagagcaccc agaaggccau cgacggcgug accaacaagg ugaacagcau caucgacaag 1200

augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

aaccugaaca agaagaugga ggacggcuuc cuggacgugu ggaccuacaa cgccgagcug 1320

cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

uacgacaagg ugagacugca gcugagagac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 173926
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABW90130

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accgugaccc acgcccagga cauccuggag aagaagcaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaaguu cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

accagaggcc uguucggcgc caucgccggc uucaucgagg gcggcuggca gggcauggug 1080

gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

gagagcaccc agaaggccau cgacggcgug accaacaagg ugaacagcau caucgacaag 1200

augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

aaccugaaca agaagaugga ggacggcuuc cuggacgugu ggaccuacaa cgccgagcug 1320

cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

uacgacaagg ugagacugca gcugagagac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 173927
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABW90132

<400> 173927

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagaagcaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacaacgcc 600

gccgagcaga ccgagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

accagaggcc uguucggcgc caucgccggc uucaucgagg gcggcuggca gggcauggug 1080

gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

gagagcaccc agaaggccau cgacggcgug accaacaagg ugaacagcau caucgacaag 1200

augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

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cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

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gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 173928
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABW90133

<400> 173928
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagaagcaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagcc cagcuucuuc 480

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cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

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gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

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gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

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cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 173929
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABW90134

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accgugaccc acgcccagga cauccuggag aagaagcaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

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gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

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gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

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augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

aaccugaaca agaagaugga ggacggcuuc cuggacgugu ggaccuacaa cgccgagcug 1320

cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

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uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

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agaaucugca ucuga 1695

<210> 173930
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABW90135

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accgugaccc acgcccagga cauccuggag aagaagcaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

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cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

aaccugaaca agaagaugga ggacggcuuc cuggacgugu ggaccuacaa cgccgagcug 1320

cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

uacgacaagg ugagacugca gcugagagac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 173931
<211> 1695

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__HB649491

<400> 173931
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accgugaccc acgcccagga cauccuggag aagaagcaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

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cacgaggcca gccugggcgu gagcagcgcc ugccccuacc agggcaagag cagcuucuuc 480

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aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

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agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

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gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

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uacgacaagg ugagacugca gcugagagac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

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<211> 1683
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<220>
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gagaacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acaccaacag aggcgugacc gccgccugcc cccacgccgg cgccaacagc 480

uucuacagaa accuggugug gcuggugaag aagggcaaca gcuaccccaa gaucaacaag 540

agcuacauca acaacaagga gaaggaggug cuggugcugu gggccaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcagaaaguu cgagcccgag aucgccacca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugge ccccagauac gccuucgccc ugaagagaaa cagcggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcgaca ccaccugcca gacccccaac 900

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aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 173935
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<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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<210> 173936
<211> 1701
<212> RNA
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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<210> 173937
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__GQ280797

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

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aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

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agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

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<210> 173938
<211> 1701
<212> RNA
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<220>
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

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cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

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gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173939
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<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI176470

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccccc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgaca ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173940
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI280341

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc aacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccgaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccac ccugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaaaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugge ccccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173941
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<212> RNA
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hemagglutinin__InfluenzaA__EPI240319

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gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173942
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI183134

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173943
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI368693

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccagcugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173944
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI291788

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acaccaacag aggcgugacc gccgccugcc cccacgccgg caccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucaacaag 540

agcuacauca acaacaagga gaaggaggug cuggugcugu gggccaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcagaaaguu cgagcccgag aucgccacca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgccc ugaagagaaa cagcggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcgaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 173945
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI482788

<400> 173945

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gugaccguga cccacagcgu gaaccugcug gagaacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acaccaacag aggcgugacc gccgccugcc cccacgccgg caccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucaacaag 540

agcuacauca acaacaagga gaaggaggug cuggugcugu gggccaucca ccaccccagc 600

accagcgccg accagcagag caucuaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcagaaaguu cgagcccgag aucgccacca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgccc ugaagagaaa cagcggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173946
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI178946/m1

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gugaccguga cccacagcgu gaaccugcug gagaacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu guucaccgcc agcagcugga gcuacaucgu ggagaccccc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

caccugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc caacagcugg 420

cccaaccacg acaccaacaa gggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaagaa gaaggaggug cuggugaucu ggggcaucca ccacccccc 600

accagcaccg accagcagac ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagagauu caagcccgag aucgccgcca gacccaaggu gagaaaccag 720

gccggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaagagagg cagcggcagc 840

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuucc uggagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccagaaga gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcaucauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccagcu ggagaagaga 1260

aucgagagcc ugaacaacaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagaugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcgccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccgug agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173947
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI482791/m2

<400> 173947
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu guucaccgcc agcagcugga gcuacaucgu ggagaccccc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

caccugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc caacagcugg 420

cccaaccacg agaccaacaa gggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaagaa gaaggaggug cuggugaucu ggggcaucca ccacccccc 600

accagcaccg accagcagac ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagagauu caagcccgag aucgccgcca gacccaaggu gagaaaccag 720

gccggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaagagagg cagcggcagc 840

ggcaucaucg ugagcgacgc ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuucc uggagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccagcu ggagaagaga 1260

aucgagagcc ugaacaacaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagaugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcgccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccgug agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173948
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI291799

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acaccaacag aggcgugacc gccgccugcc cccacgccgg caccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucaacaag 540

agcuacauca acaacaagga gaaggaggug cuggugcugu gggccaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcagaaaguu cgagcccgag aucgccacca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgccc ugaagagaac cagcggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcgaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucagccaccu ggagagaaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173949
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI482799

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agaccaacag aggcgugacc gccgccugcc cccacgccgg caccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucaacaag 540

agcuacauca acaacaagga gaaggaggug cuggugcugu gggccaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcagaaaguu cgagcccgag aucgccacca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgccc ugaagagaac cagcggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcgaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucagccaccu ggagagaaga 1260

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173950
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI291807

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu guucgccgcc agcagcugga gcuacaucgu ggagaccccc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

caccugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc caacagcugg 420

cccaaccacg acaccaacaa gggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaagaa gaaggaggug cuggugaucu ggggcaucca ccacccccc 600

accagcaccg accagcagac ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagagauu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa uggacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaagagagg cagcggcagc 840

ggcaucaucg ugagcgacgc ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucagccagcu ggagaagaga 1260

aucgagagcc ugaacaacaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcgccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccgug agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173951
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI638970

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaga acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acaccaacaa gggcgugacc gccgccugcc cccacagcgg caccaacagc 480

uucuacagaa accuggugug gcuggugcag aagggcaaca gcuaccccaa gaucaacaag 540

agcuacauca acaacaagga gaacgaggug cuggugcugu gggccaucca ccaccccagc 600

accagcgccg accagcagag ccuguacaag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcagaaaguu cgagcccgag aucgccacca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucaccc ugaagagaaa cagcggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcgaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccaagau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173952
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABI19015

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gugaccguga cccacagcgu gaaccugcug gagaacaagc acgacggcaa gcugugcaag 180

cugagaggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu guucaccacc agcagcugga gcuacaucgu ggagaccccc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

caccugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc caacagcugg 420

cccuaccacg acaccaacaa gggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaagaa gaaggaggug cuggugaucu ggggcaucca ccacccccc 600

accagcaccg accagcagac ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagagauu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa uggacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca ugaagagagg cagcggcagc 840

ggcaucaucg ugagcgacgc ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gacaggagau cgacggcgug 1560

aagcuggaga gcgccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccgug agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173953
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI687790

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugggcggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaaccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173954
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI841265

<400> 173954
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugggcggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaaccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag caucuaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ucaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcaacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173955
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI291846

<400> 173955
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacaagc acgacggcaa gcugugcaac 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu guucaccgcc agcagcugga gcuacaucgu ggagaccccc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

caccugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggu gaacagcugg 420

cccaaccacg acaccaacaa gggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaagaa gaaggaggug cuggugaucu ggggcaucca ccacccccc 600

accagcaccg accagcagac ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagagauu cgagcccgag aucgccgcca gacccaaggu gagaaaccag 720

gccggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca ugagaagagg cagcggcagc 840

ggcaucaucg ugagcgacgc ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuucc uggagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucagccagcu ggagaagaga 1260

aucgagagcc ugaacaacaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagaugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugag aaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcgccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccgug agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173956
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__EPI558121

<400> 173956
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gugaccguga cccacagcgu gaaccugcug gagaacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu ucccccagac cagcagcugg 420

cccaaccacg acaccaacag aggcgugacc gccgccugcc cccacgccgg caccaacagc 480

uucuacagaa accuggugug gcuggugaag aagggcaaca gcuacagcaa gaucaacaag 540

agcuacauca acaacaagga gaaggaggug cuggugcugu gggccaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcagaaaguu cgagcccgag aucgccacca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggc ccccagauac gccuucgccc ugaagagaaa cagcggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcgaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucagccaccu ggagagaaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucuga 1695

<210> 173957
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI564139

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

ugccccagau acgugaagca cagcacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggcau cuucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173958
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI786706

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaaccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173959
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI395313

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gugaccguga cccacagcgu gaaccugcug gagaacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acaccaacag aggcgugacc gccgccugcc cccacgccgg caccaagagc 480

uucuacaaga accugaucug gaucgccaag aagggcaaca gcuaccccaa gaucaacaag 540

agcuacauca acaacaagga gaaggaggug cuggugcugu gggccaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcagaaaguu cgagcccgag aucgccacca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggguggc ccccagauac gccuucgccc ugaagagaaa cagcggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcgaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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ugcuucgagu ucuaccacaa gugcgacgac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggugau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acgccaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173960
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI291696

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagac acaacggcaa gcugugcaag 180

cugagaggcg ugcccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu guucaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccgaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acaagaaguu caagcccgag auggccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggcccccg gcgacaccau caccuucgag 780

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ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcuga gcgugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173961
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACU80014

<400> 173961
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gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugggcggca ucgccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu gcugaccgug agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcugguggag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacguga acaacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acagaaaguu caagcccgag aucgccgcca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaacagagg cagcggcagc 840

ggcaucauca ucagcgacgc ccccgugcac gacugcaaca ccaagugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu uccacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug agaaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173962
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI177400

<400> 173962
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggcccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173963
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACT36512

<400> 173963

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173964
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__AJE30344

<400> 173964
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aucggcuacc acgccaacaa cagcaccaag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcacc cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagaac cugaucaucc ccagaagcag cuggcccaac 420

cacgagacca gccugggcgu gagcgccgcc ugccccuacc agggcgccag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac gacgccuacc ccaccaucaa gaucagcuac 540

aacaacacca acagagagga ccugcugauc cugugggca uccaccacag caacaacgcc 600

gccgagcaga ccaaccugua caagaacccc gacaccuacg ugagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagcc aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agauggagua cggccacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu accccaagua cagcgaggag gccauccuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau cguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 173965
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI178948

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acaccaacag aggcgugacc gccgccugcc cccacgccgg caccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucaacaag 540

agcuacauca acaacaagga gaaggaggug cuggugcugu gggccaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcagaaaguu cgagcccgag aucgccacca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgccc ugaagagaaa cagcggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcgaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucagccaccu ggagagaaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173966
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI178949

<400> 173966
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acaccaacag aggcgugacc gccgccugcc cccacgccgg caccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucaacaag 540

agcuacauca acaacaagga gaaggaggug cuggugcugu gggccaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcagaaaguu cgagcccgag aucgccacca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgccc ugaagagaaa cagcggcagc 840

ggcaucauca ucagcgacac cagcgugcac gacugcgaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173967
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI590132

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu ggccaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcaaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaag uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agaccaacaa gggcgugacc gccgccugcc cccacgccgg caccaacagc 480

uucuacaaga accugaucug gcuggugaag aaggagaaca gcuaccccaa gaucaacauc 540

agcuacacca acaacagagg caaggaggug cuggugcugu gggccaucca ccaccccccc 600

accagcaccg accagcagag ccuguaccag aacgccaaca gcuacguguu cgugggcagc 660

agcagauaca gcagaaaguu cgagcccgag aucgccacca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgccc ugaagagaaa cagcggcagc 840

ggcaucauca ucagcgagac ccccgugcac gacugcgaca ccaccugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

acccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcauc 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagag ugugcaucug a 1701

<210> 173968
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABU80400

<400> 173968
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu guucaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acaagaaguu caagcccgag aucgccacca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaagagagg cagcggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173969
<211> 1698
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABO21709

<400> 173969
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacagcc acaacggcaa gcugugcaga 180

cugaagggca ucgccccccu gcagcugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgacccccu gcugcccgug agaagcugga gcuacaucgu ggagaccccc 300

aacagcgaga acggcaucug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagga gagcagcugg 420

cccaaccaca acaccaacgg cgugaccgcc gccugcagcc acgagggcaa gagcagcuuc 480

uacagaaacc ugcuguggcu gaccgagaag gagggcagcu accccaagcu gaagaacagc 540

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agcaaggagc agcagaaccu guaccagaac gagaacgccu acgugagcgu ggugaccagc 660

aacuacaaca gaagauucac ccccgagauc gccgagagac ccaaggugag agaccaggcc 720

ggcagaauga acuacuacug gacccugcug aagcccggcg acaccaucau cuucgaggcc 780

aacggcaacc ugaucgcccc cauguacgcc uucgcccuga gcagaggcuu cggcagcggc 840

aucaucacca gcaacgccag caugcacgag ugcaacacca agugccagac cccccugggc 900

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aucgacggcu gguacggcua ccaccaccag aacgagcagg gcagcggcua cgccgccgac 1140

cagaagagca cccagaacgc caucaacggc aucaccaaca aggugaacac cgugaucgag 1200

aagaugaaca uccaguucac cgccgugggc aaggaguuca acaagcugga gaagagaaug 1260

gagaaccuga acaagaaggu ggacgacggc uuccuggaca ucuggaccua caacgccgag 1320

cugcuggugc ugcuggagaa cgagagaacc cuggacuucc acgacagcaa cgugaagaac 1380

cuguacgaga aggugaagag ccagcugaag aacaacgcca aggagaucgg caacggcugc 1440

uucgaguucu accacaagug cgacaacgag ugcauggaga gcgugagaaa cggcaccuac 1500

gacuacccca aguacagcga ggagagcaag cugaacagag agaaggugga cggcgugaag 1560

cuggagagca ugggcaucua ccagauccug gccaucuaca gcaccguggc cagcagccug 1620

gugcugcugg ugagccuggg cgccaucagc uucuggaugu gcagcaacgg cagccugcag 1680

ugcagaaucu gcaucuga 1698

<210> 173970
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__CAZ65588

<400> 173970
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac gagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173971
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI697744

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaaccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173972
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI768525

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaaccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173973
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI726930

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaaccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173974
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__EPI813817

<400> 173974
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugaaccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccacca gacccaaggu gagagaccag 720

gaggccagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173975
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI466626

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173976
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI541966

<400> 173976
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173977
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI652003

<400> 173977
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg agagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagccag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccacccccc 600

accaccgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcacc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucacca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccgag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augguggacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gaccugaaga gcacccagaa cgccaucgac aagaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aaaccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagagaagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

guggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173978
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI291877

<400> 173978
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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaacauccug gagaacaagc acgacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu guucgccgcc agcagcugga gcuacaucgu ggagaccccc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

caccugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc caacagcugg 420

cccaaccacg acaccaacaa gggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaagaa gaaggaggug cuggugaucu ggggcaucca ccacccccc 600

accagcaucg accagcagac ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagagauu caagcccgag aucgccgcca gacccaaggu gagagaccag 720

gccggcagaa uggacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaagagagg cagcggcagc 840

ggcaucaucg ugagcgacgc ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

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gagaagauga acacccaguu caccgccgug ggcaaggagu ucagccagcu ggagaagaga 1260

aucgagagcc ugaacaacaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcauc 1560

aagcuggaga gcgccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccgug agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173979
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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<400> 173979
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gugaccguga cccacagcgu gaaccugcug gaggacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagcugcu guucaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc cagcagcugg 420

cccaaccacg agaccaacag aggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacguga acaacaagga gaaggaggug cuggugcugu ggggcaucca ccacccccc 600

accagcaccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca acaagaaguu caagcccgag aucgccacca gacccaaggu gagaggccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaccau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca ugaagagagg cagcggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa caucccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

augaucgacg gcugguacgg cuaccaccac cagaacgagc agggcagcgg cuacgccgcc 1140

gacagaaaga gcacccagaa cgccaucgac ggcaucacca acaaggugaa cagcgugauc 1200

gagaagauga acacccaguu caccgccgug ggcaaggagu ucaaccaccu ggagaagaga 1260

aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acguguggac cuacaacgcc 1320

gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggagagc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173980
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI291885

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gagaccaagc acgacggcaa gcugugcaac 180

cugaagggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu guucaccgcc agcagcugga gcuacaucgu ggagaccccc 300

aacagcgaca acggcaccug cuaccccggc aacuucauca acuacgagga gcugagagag 360

caccugagca gcgugagcag cuucgagaga uucgagaucu uccccaaggc caacagcugg 420

cccaaccacg acaccaacaa gggcgugacc gccgccugcc ccuacgccgg cgccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acaacaagaa gaaggaggug cuggugaucu ggggcaucca ccacccccc 600

accagcaccg accagcagac ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcaaguaca gcaagagauu cgagcccgag aucgccgcca gacccaaggu gagaaaccag 720

gccggcagaa ugaacuacua cuggacccug aucgagcccg gcgacaccau caccuucgag 780

gccaccggca accuggugu gcccagauac gccuucgcca ugagaagagg cagcggcagc 840

ggcaucaucg ugagcgacgc ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

cccaaguacg ugaagagcac caagcugaga auggccaccg gccugagaaa cauccccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuucc uggagggcgg cuggaccggc 1080

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aucgagagcc ugaacaacaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

gagaugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcgccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugc uggugagccu gggcgccgug agcuucugga ugugcagcaa cggcagccug 1680

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<210> 173981
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI176515

<400> 173981

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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagaccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

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auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacaac accugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173982
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI189182

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ugcaucggcu accacgccaa caacagcacc gacaccgugg acaccgugcu ggagaagaac 120

gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagaggccag 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

auccagagca gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggaccggc 1080

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aucgagaacc ugaacaagaa gguggacgac ggcuuccugg acaucuggac cuacaacgcc 1320

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

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cuggugcugg uggugagccu gggcgccauc agcuucugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 173983
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI180574

<400> 173983
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gugaccguga cccacagcgu gaaccugcug gaggacaagc acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gauccugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

agcagcgaca acggcaccug cuaccccggc gacuucaucg acuacgagga gcugagagag 360

cagcugagca gcgugagcag cuucgagaga uucgagaucu uccccaagac cagcagcugg 420

cccaaccacg acagcaacaa gggcgugacc gccgccugcc cccacgccgg cgccaagagc 480

uucuacaaga accugaucug gcuggugaag aagggcaaca gcuaccccaa gcugagcaag 540

agcuacauca acgacaaggg caaggaggug cuggugcugu ggggcaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcaagaaguu caagcccgag aucgccauca gacccaaggu gagagacaga 720

gagggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

gccaccggca accugguggu gcccagauac gccuucgcca uggagagaaa cgccggcagc 840

ggcaucauca ucagcgacac ccccgugcac gacugcaaca ccaccugcca gacccccaag 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccaucaccau cggcaagugc 960

cccaaguacg ugaagagcac caagcugaga cuggccaccg gccugagaaa cgugcccagc 1020

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uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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cagugcagaa ucugcaucug a 1701

<210> 173984
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI377499

<400> 173984
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga acggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

gccgaccuga agagcaccca ggccgccauc gaccagauca acggcaagcu gaacagacug 1200

aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

agaugcaaca ucugcaucug a 1701

<210> 173985
<211> 1701

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI346916

<400> 173985
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gugaccguga cccacagcgu gaaccugcug gagaacagac acaacggcaa gcugugcaag 180

cugagaggcg uggccccccu gcaccugggc aagugcaaca ucgccggcug gcugcugggc 240

aaccccgagu gcgagagccu gagcaccgcc agcagcugga gcuacaucgu ggagaccagc 300

aacagcgaca acggcaccug cuaccccggc gacuucauca acuacgagga gcugagagag 360

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cccaaccacg acaccaacag aggcgugacc gccgccugcc cccacgacgg caccaacagc 480

uucuacagaa accugaucug gcuggugaag aagggcaaca gcuaccccaa gaucaacaag 540

agcuacauca acaacaagga gaaggagauc cuggugcugu gggccaucca ccaccccagc 600

accagcgccg accagcagag ccuguaccag aacgccgacg ccuacguguu cgugggcagc 660

agcagauaca gcagaaaguu cgagcccgag guggccacca gacccaaggu gagagaccag 720

gccggcagaa ugaacuacua cuggacccug guggagcccg gcgacaagau caccuucgag 780

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ggcaucauca ucagcgacac cagcgugcac gacugcgaca ccaacugcca gacccccaac 900

ggcgccauca acaccagccu gcccuuccag aacauccacc ccgugaccau cggcgagugc 960

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gagcugcugg ugcugcugga gaacgagaga acccuggacu accacgacag caacgugaag 1380

aaccuguacg agaaggugag aagccagcug aagaacaacg ccaaggagau cggcaacggc 1440

ugcuucgagu ucuaccacaa gugcgacgac augugcaugg agagcgugaa gaacggcacc 1500

uacgacuacc ccaaguacag cgaggaggcc aagcugaaca gagaggagau cgacggcgug 1560

aagcuggaga gcaccagaau cuaccagauc cuggccaucu acagcaccgu ggccagcagc 1620

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<210> 173986
<211> 1689
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ACV49600

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gugacccacg ccaaggacau ccuggagaag acccacaacg gcaagcugug caagcugaac 180

ggcaucccccc cccuggagcu gggcgacugc agcaucgccg gcuggcugcu gggcaacccc 240

gagugcgaca gacugcugag cgugcccgag uggagcuaca ucauggagaa ggagaacccc 300

agagacggcc ugugcuaccc cggcagcuuc aacgacuacg aggagcugaa gcaccugcug 360

agcagcguga agcacuucga gaaggugaag auccugccca aggacagaug gacccagcac 420

accaccaccg gcggcagcag agccugcgcc gugagcggca accccagcuu cuucagaaac 480

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cagagaaccc uguaccagaa cgugggcacc uacgugagcg ugggcaccag cacccugaac 660

aagagaagca cccccgagau cgccaccaga cccaagguga acggccaggg cggcagaaug 720

gaguucagcu ggacccugcu ggacaugugg gacaccauca acuucgagag caccggcaac 780

cugaucgccc ccgaguacgg cuucaagauc agcaagagag gcagcagcgg caucaugaag 840

accgagggca cccuggagaa cugcgagacc aagugccaga ccccccuggg cgccaucaac 900

accacccugc ccuuccacaa cgugcacccc cugaccaucg gcgagugccc caaguacgug 960

aagagcgaga agcuggugcu ggccaccggc cugagaaacg ugccccagau cgagagcaga 1020

ggccuguucg gcgccaucgc cggcuucauc gagggcggcu ggcagggcau gguggacggc 1080

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cugauggaga acgagagaac ccuggacuuc cacgacagca acgugaagaa ccuguacgac 1380

aaggugagaa ugcagcugag agacaacgug aaggagcugg gcaacggcug cuucgaguuc 1440

uaccacaagu gcgacgacga gugcaugaac agcgugaaga acggcaccua cgacuacccc 1500

aaguacgagg aggagagcaa gcugaacaga aacgagauca agggcgugaa gcugagcagc 1560

augggcgugu accagauccu ggccaucuac gccaccgugg ccggcagccu gagccuggcc 1620

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<210> 173987
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<212> RNA
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acccugaucg acgcccugcu gggcgacccc cacugcgacg uguuccagaa cgagaccugg 300

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uucaccugga ccggcgugac ccagaacggc ggcagcaacg ccugcaagag aggccccggc 480

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aacgugacca ugcccaacaa cgacaacuuc gacaagcugu acaucugggg cgugcaccac 600

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ggccugagca gcagaaucag caucuacugg accaucguga agcccggcga cgugcuggug 780

aucaacagca acggcaaccu gaucgccccc agaggcuacu ucaagaugag aaccggcaag 840

agcagcauca ugagaagcga cgcccccauc gacaccugca ucagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acaagaucac cuacggcgcc 960

ugccccaagu acgugaagca gaacacccug aagcuggcca ccggcaugag aaacgugccc 1020

gagaagcaga ccagaggccu guucggcgcc aucgccggcu ucaucgagaa cggcugggag 1080

ggcaugaucg acggcuggua cggcuucaga caccagaaca gcgagggcac cggccaggcc 1140

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aucgagaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucgagagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuucagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173989
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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

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aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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<210> 173990
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<212> RNA
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<220>
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

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uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaagag aggcagcaac 480

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuacagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaugcaaca ucugcaucug a 1701

<210> 173991
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI668105

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

ggcaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<210> 173992
<211> 1701
<212> RNA
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<220>
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uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuucccc uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

ggcaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 173993
<211> 1701
<212> RNA
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gugcagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg caagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagagaugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa cgacgagagc 420

uucaacuggg ccggcgugac ccagaacggc accagcagcg ccugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaca gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuucccc uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

ggcaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcauggugg acggcuggua cggcuucaga caccagaaca gcgagggcag aggccaggcc 1140

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuucccc uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

ggcaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

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gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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<211> 1701
<212> RNA
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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

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gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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<211> 1701
<212> RNA
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<210> 174008
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<212> RNA
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<220>
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hemagglutinin__InfluenzaA__EPI404927

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuucccc uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

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gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

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gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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<212> RNA
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agcagcuucu ucagcagacu gaacuggcug acccaccuga acagcaagua ccccgcccug 540

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cccgugaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuacagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 174025
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aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuucagacc cagaaucaga 720

gacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

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agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga acggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 174027
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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga acggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuucagacc cagaaucaga 720

aacaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 174028
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<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

gaccuguucg uggagagaag caaggccuac agcaacugcu accccuacga cgugcccgac 360

uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga acggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuucagacc cagaaucaga 720

aacaacccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcgaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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agaugcaaca ucugcaucug a 1701

<210> 174029
<211> 1701
<212> RNA
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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga acggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcaac 480

aacagcuucu ucagcagacu gaacuggcug acccaccuga acuucaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccgugaccg acaaggacca gaucuuccug uacgcccagc ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcuucagacc cagaaucaga 720

aacaacccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

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agaugcaaca ucugcaucug a 1701

<210> 174030
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI562037

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aacagcagca ucggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuucccc uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

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<210> 174031
<211> 1701
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__EPI562034

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaccua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuuccug uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

gacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 174032
<211> 1701
<212> RNA
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<220>
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hemagglutinin__InfluenzaA__EPI653140

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ggcaacgaca acagcaccgc cacccugugc cugggccacc acgccgugcc caacggcacc 120

aucgugaaga ccaucaccaa cgacagaauc gaggugacca acgccaccga gcuggugcag 180

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagcg ccugcaucag aagaagcagc 480

agcagcuucu ucagcagacu gaacuggcug acccaccuga acuacaagua ccccgcccug 540

aacgugacca ugcccaacaa cgagcaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaaggacca gaucuucccc uacgcccaga gcagcggcag aaucaccgug 660

agcaccaaga gaagccagca ggccgugauc cccaacaucg gcagcagacc cagaaucaga 720

ggcaucccca gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca agagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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agaauccagg accuggagaa guacguggag gacaccaaga ucgaccugug gagcuacaac 1320

gccgagcugc ugguggcccu ggagaaccag cacaccaucg accugaccga cagcgagaug 1380

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ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acaacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

uuccugcugu gcguggcccu gcugggcuuc aucauguggg ccugccagaa gggcaacauc 1680

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

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cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

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gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcagc 420

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gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

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cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

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aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

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<212> RNA
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agcagcagca ccggcgagau cugcgacagc ccccaccaga uccuggacgg cgagaacugc 240

acccugaucg acgcccugcu gggcgacccc cagugcgacg gcuuccagaa caagaagugg 300

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uacgccagcc ugagaagccu gguggccagc agcggcaccc uggaguucaa caacgagagc 420

uucaacugga ccggcgugac ccagaacggc accagcagca gcugcaucag aggcagcaac 480

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aacgugacca ugcccaacaa cgagaaguuc gacaagcugu acaucugggg cgugcaccac 600

cccggcaccg acaacgacca gaucuucccc uacgcccagg ccagcggcag aaucaccgug 660

agcaccaaga gaagccagca gaccgugauc cccaacaucg gcagcagacc cagagugaga 720

aacauccccа gcagaaucag caucuacugg accaucguga agcccggcga cauccugcug 780

aucaacagca ccggcaaccu gaucgccccc agaggcuacu ucaagaucag aagcggcaag 840

agcagcauca ugagaagcga cgcccccauc ggcaagugca acagcgagug caucaccccc 900

aacggcagca uccccaacga caagcccuuc cagaacguga acagaaucac cuacggcgcc 960

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aucggcaaga ccaacgagaa guuccaccag aucgagaagg aguucagcga gguggagggc 1260

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aacaagcugu ucgagaagac caagaagcag cugagagaga acgccgagga caugggcaac 1440

ggcugcuuca agaucuacca caagugcgac aacgccugca ucggcagcau cagaaacggc 1500

accuacgacc acgacgugua cagagacgag gcccugaaca acagauucca gaucaagggc 1560

guggagcuga agagcggcua caaggacugg auccugugga ucagcuucgc caucagcugc 1620

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<210> 174036
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

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aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174037
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI500771

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

ccccugugcg acgaguucac caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

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cacgaggcca gccugggcgu gagcgccgcc ugcagcuacc agggcaacag cagcuucuuc 480

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gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

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agaaucgacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

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aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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ggcugcuucg aguucuacca caagugcaac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caucuaccag auccugagca ucuacagcac cguggccagc 1620

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<210> 174038
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ABF93441

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

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agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

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<210> 174039
<211> 1707

<212> RNA
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<220>
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aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cgacgugccc gaguggagcu acaucgugga gaaggccaac 300

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cugagcagaa ucaaccacuu cgagaagauc agaaucaucc ccaaggacag cuggcccgac 420

cacgaggcca gccugggcgu gagcgccgcc ugcagcuacc agggcaacag cagcuucuuc 480

agaaacgugg uguggcugcu gaagaaggac aacgccuacc ccaucaucaa gaagagcuac 540

aacaacacca acaaggagga ccugcuggug cugugggca uccaccaccc caacgacgag 600

gccgagcaga ccagacugua ccagaacccc accaccuacg ugagcaucgg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaaucgacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

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aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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agcagccugg ugcuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174040
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGC13463

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cgacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc agaaucaucc ccaaggacag cuggcccgac 420

cacgaggcca gccugggcgu gagcgccgcc ugcagcuacc agggcaacag cagcuucuuc 480

agaaacgugg uguggcugcu gaagaaggac aacgccuacc ccaucaucaa gaagagcuac 540

aacaacacca acaaggagga ccugcuggug cugugggca uccaccaccc caacgacgag 600

gccgagcaga ccagacugua ccagaacccc accaccuacg ugagcaucgg caccagcacc 660

cugaaccaga gacuggugcc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaaucgacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augagaagcg agguggagua cggcaacugc agcaccagau gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccagaucgag 1020

agaagaagaa gaaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacaagugc gacaacgagu gcauggagag cgugagaaac 1500

ggcaccuacg acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

ggcgugaagc uggagagcau cggcaccuac cagauccuga gcaucuacag caccguggcc 1620

agcagccugg ugcuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174041
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACI06178/m1

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggcccagc 420

cacgaggcca gccugggcgu gagcgccgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug auguggggca uccaccaccc caacgacgcc 600

gccgagcaga ccaaccugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacugacccc cagaaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

ggcagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacaagugc gacaacgagu gcauggagag cgugagaaac 1500

ggcaccuacg acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

ggcgugaagc uggagagcau cggcaucuac cagauccuga gcaucuacag caccguggcc 1620

agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174042
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AHF20402

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga gaccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgugaacg accugugcua ccccggcgug uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggcccagc 420

cacgaggcca gccugggcgu gagcgccgcc ugccccuacc agggccagag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug augugggca uccaccaccc caacgacgcc 600

guggagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacugacccc cagaaucgcc accagaagca aggugaaggg ccugagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augagaagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaccagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

gagagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacaagugc gacaacaagu gcauggagag cgugagaaac 1500

ggcaccuacg acuacccccа guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174043
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ABQ45850

<400> 174043
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac gacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

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ggcaccuacg acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174044
<211> 1713
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AKI82373

<400> 174044
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugagc gaguggagcu acaucgugga gaaggccagc 300

cccgccaacg gccugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugaacagaa ucacccaccu gaagaagauc aagaucaucc ccaagagcua cuggagcaac 420

cacgaggcca gcagcggcgu gagcgccgcc ugcagcuaca ugggcgagcc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc cccccaucaa ggugaacuac 540

accaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacaacgag 600

gccgagcaga uccagaucua ccagaaccug aucacccaca ucagcguggg caccagcacc 660

cugaaccaga gacugauccc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgaca gcaucaacuu cgacagcaac 780

ggcaacuuca ucgcccccga guacgccuac aucgugaaga agggcgacag cgccaucaug 840

aagagcgagc uggaguacgg caacugcaac accaagugcc agacccccau gggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acgcccccca gagagagaga 1020

gagggcggca gaagaagaaa gagaggccug uucggcgcca ucgccggcuu caucgagggc 1080

ggcuggcagg gcauggugga cggcugguac ggcuaccacc acagcaacga gcagggcagc 1140

ggcuacgccg ccgacaagga gagcacccag aaggccaucg acggcaucac caacaaggug 1200

aacagcauca ucgacaagau gaacacccag uucgaggccg ugggcagaga guucaacaac 1260

cuggagagaa gaaucgagaa ccugaacaag aagauggagg acggcuuccu ggacgugugg 1320

accuacaacg ccgagcugcu ggugcugaug gagaacgaga gaacccugga cuuccacgac 1380

agcaacguga agaaccugua cgagaaggug agacugcagc ugagagacaa cgccaaggag 1440

cugggcaacg gcugcuucga guucuaccac aagugcgaca acgagugcau ggagagcgug 1500

agaaacggca ccuacgacua cagccaguac agcgaggagg ccagacugag cagagaggag 1560

aucaacggcg ugaagcugga gagcauggug accuaccaga uccugagcau cuacagcacc 1620

guggccagca gccuggcccu ggccaucaug guggccggcc ugagccugug gaugugcagc 1680

aacggcagcc ugcagugcag aaucugcauc uga 1713

<210> 174045
<211> 1713
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI284473

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugagc gaguggagcu acaucgugga gaaggccagc 300

cccgccaacg gccugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugaacagaa ucacccaccu gaagaagauc aagaucaucc ccaagagcua cuggagcaac 420

cacgaggcca gcagcggcgu gagcgccgcc ugcagcuaca ugggcgagcc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc cccccaucaa ggugaacuac 540

accaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacaacgag 600

gccgagcaga uccagaucua ccagaaccug aucacccaca ucagcguggg caccagcacc 660

cugaaccaga gacugauccc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgaca gcaucaacuu cgacagcaac 780

ggcaacuuca ucgcccccga guacgccuac aucgugaaga agggcgacag cgccaucaug 840

aagagcgagc uggaguacgg caacugcaac accaagugcc agacccccau gggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acgcccccca gagagagaga 1020

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ggcuggcagg gcauggugga cggcugguac ggcuaccacc acagcaacga gcagggcagc 1140

ggcuacgccg ccgacaagga gagcacccag aaggccaucg acggcaucac caacaaggug 1200

aacagcauca ucgacaagau gaacacccag uucgaggccg ugggcagaga guucaacaac 1260

cuggagagaa gaaucgagaa ccugaacaag aagauggagg acggcuuccu ggacgugugg 1320

accuacaacg ccgagcugcu ggugcugaug gagaacgaga gaacccugga cuuccacgac 1380

agcaacguga agaaccugua cgagaaggug agacugcagc ugagagacaa cgccaaggag 1440

cugggcaacg gcugcuucga guucuaccac aagugcgaca acgagugcau ggagagcgug 1500

agaaacggca ccuacgacua cagccaguac agcgaggagg ccagacugag cagagaggag 1560

aucaacggcg ugaagcugga gagcauggug accuaccaga uccugagcau cuacagcacc 1620

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aacggcagcc ugcagugcag aaucugcauc uga 1713

<210> 174046
<211> 1710
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ACO07033

<400> 174046
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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugagc gaguggagcu acaucgugga gaaggccagc 300

cccgccaacg gccugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccaccu gaagaagauc aagaucaucc ccaagagcua cuggagcaac 420

cacgaggcca gcagcggcgu gagcgccgcc ugcagcuacc ugggcgagcc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc cccccaucaa ggugaacuac 540

accaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgag 600

aaggagcaga ucagaaucua ccagaacccc aacaccagca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaccca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgaca gcaucaacuu cgacagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucgcca agaagggcga cagcgugauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacgcccc ccagagagag 1020

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agcaucaucg acaagaugaa cacccaguuc gagaucgugg gcagagaguu caacaaccug 1260

gagagaagaa ucgagaaccu gaacaagaag auggaggacg gcuuccugga cguguggacc 1320

uacaacgccg agcugcuggu gcugauggag aacgagagaa cccuggacuu ccacgacagc 1380

aacgugaaga accuguacga gaaggugaga cugcagcuga gagacaacgc caaggagcug 1440

ggcaacggcu gcuucgaguu cuaccacaag ugcgacaacg agugcaugga gagcgugaga 1500

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ggcagccugc agugcagaau cugcaucuga 1710

<210> 174047
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI174803

<400> 174047
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugagc gaguggagcu acaucgugga gaaggccagc 300

cccgccaacg gccugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccaccu gaagaagauc aagaucaucc ccaagagcua cuggagcaac 420

cacgaggcca gcagcggcgu gagcgccgcc ugcagcuacc ugggcgagcc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc cccccaucaa ggugaacuac 540

accaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgag 600

aaggagcaga ucagaaucua ccagaacccc aacaccagca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaccca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgaca gcaucaacuu cgacagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucgcca agaagggcga cagcgugauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacgcccc ccagaccgag 1020

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gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

gagagcaccc agaaggccau cgacggcauc accaacaagg ugaacagcau caucgacaag 1200

augaacaccc aguucgagau cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

aaccugaaca agaagaugga ggacggcuuc cuggacgugu ggaccuacaa cgccgagcug 1320

cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

uacgagaagg ugagacugca gcugagagac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acaagugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug agcagagagg agaucagcgg cgugaagaug 1560

gagagcaugg ugaccuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 174048
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGZ62382

<400> 174048
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aucggcuacc acgccaacaa cagcaccaag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg gccugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc agaaucaucc ccaaggacag cuggagcgac 420

cacgaggcca gccugggcgu gagcgccgcc ugccccuacc agggcaacag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacaccuacc ccaccaucaa gaagagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccaccc caacgacgag 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca agaucaacgg ccagagcggc 720

agaaucgacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agguggagua cggcaacugc aacaccagau gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

agaaaccugu acgacaaggu gagacugcag cugaaggaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcaac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga gaagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caucuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggugc uggccaucau gauggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 174049
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__ABG67978/m

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggggca uccaccacag caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

aucaagagcg agguggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

agaaucgaga accugaacaa gaagauggag gacggcuucc uggacgugug gaccuacaac 1320

gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 174050
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI827075

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

ccccugugcg acgaguucac caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaaggacag cuggagcgac 420

cacgaggcca gccugggcgu gagcgccgcc ugcagcuacc agggcaacag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gaagggcuac 540

aacaacacca acagagagga ccugcugauc cugugggggca uccaccaccc caacgacgag 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca agaucaacgg ccagagcggc 720

agaaucgacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augagaagcg agguggagua cggcaacugc aacaccagau gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

accagaggcc uguucggcgc caucgccggc uucaucgagg gcggcuggca gggcauggug 1080

gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

gagagcaccc agaaggccau cgacggcgug accaacaagg ugaacagcau caucgacaag 1200

augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

aaccugaaca agaagaugga ggacggcuuc cuggacgugu ggaccuacaa cgccgagcug 1320

cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

uacgacaagg ugagacugca gcugaaggac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acaagugcaa caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaucuacca gauccugagc aucuacagca ccguggccag cagccuggug 1620

cuggccauca ugauggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 174051
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ABP96850

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

uacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ucagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag agcaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

agaagaagaa gaaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucaaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacagaugc gacaacgagu gcauggagag cgugagaaac 1500

ggcaccuacg acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

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agcagccugg cccuggccau caugguggcc ggccuguucc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174052
<211> 1692
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI827077

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaaggacag cuggagcgac 420

cacgaggcca gcggcgugag cagcgccugc cccuaccagg gcagaagcag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacgac gccuacccca ccaucaagaa gagcuacaac 540

aacaccaacc aggaggaccu gcuggugcug uggggcaucc accaccccaa cgacgccgcc 600

gagcagacca gacuguacca gaaccccacc accuacauca gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

auggaguucu ucuggaccau ccugaagagc aacgacgcca ucaacuucga gagcaacggc 780

aacuucaucg cccccgagaa cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgagc uggaguacag caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acagccccca gagagagacc 1020

agaggccugu ucggcgccau cgccggcuuc aucgagggcg gcuggcaggg caugguggac 1080

ggcugguacg gcuaccacca cagcaacgag cagggcagcg gcuacgccgc cgacaaggag 1140

agcacccaga gagccaucga cggcgugacc aacaagguga acagcaucau cgacaagaug 1200

aacacccagu ucgaggccgu gggcagagag uucaacaacc uggagagaag aaucgagaac 1260

cugaacaaga agauggagga cggcuuccug gacgugugga ccuacaacgc cgagcugcug 1320

gugcugaugg agaacgagag aacccuggac uuccacgaca gcaacgugaa gaaccuguac 1380

gacaagguga gacugcagcu gagagacaac gccaaggagc ugggcaacgg cugcuucgag 1440

uucuaccaca gaugcgacaa cgagugcaug gagagcguga gaaacggcac cuacgacuac 1500

ccccaguaca gcgaggaggc cagacugaag agagaggaga ucagcggcgu gaagcuggag 1560

agcaucggca ccuaccagau ccugagcauc uacagcaccg uggccagcag ccuggcccug 1620

gccaucaugg uggccggccu gagccugugg augugcagca acggcagccu gcagugcaga 1680

aucugcaucu ga 1692

<210> 174053
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI594523

<400> 174053

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcaaccug 180

aacggcguga agccccugau ccuggaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acaaguuccu gaacgugagc gaguggagcu acaucgugga gaaggccggc 300

cccgccaacg gccugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc gagaucaucc ccaagaacca cuggagcaac 420

cacaacacca gcggcgugag cagcgccugc agcuaccugg agaaccccag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacaac accuacccca ccaucaaggu gaacuacacc 540

aacgccaacc agaaggaccu gcuggugcug uggggcaucc accaccccaa caacgaggcc 600

gagcagaaga ugaucuacca gaacagcaac accuacguga gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagcaagg ugaacggcca gagcggcaga 720

aucgacuucu ucuggaccau ccugaagccc aacgacacca ucaacuucga cagcaacggc 780

aacuucaucg cccccaagua cgccuacaag aucgugaaga agggcgacag cgccaucaug 840

aagagcgagc ugaaguacga caacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

gugaagagca acagacuggu gcuggccacc ggccugagaa acgcccccca gaucgagggc 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccgug gacggcauca ccaacaagau caacagcauc 1200

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gccgagcugc uggugcugau ggagaacgag agaacccugg acuuccacga cagcaacgug 1380

aagaaccugu acgagaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gaagaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga acagagagga gaucagcggc 1560

gugaagcugg agagcaccgu gaccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggugc uggccaucau gguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 174054
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AAD37782

<400> 174054
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccagc 300

cccgccaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

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cacgacgcca gcagcggcgu gagcagcgcc ugccccuacc acggcagaag cagcuucuuc 480

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aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

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cugaaccaga gacuggugcc cgagaucgcc accagaccca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacacccc ccagagagag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg ugaacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagcagaug gaggacggcu uccuggacgu guggaccuac 1320

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ggcaccuacg acuaccccca guacagcgag gaggccagac ugaacagaga ggagaucagc 1560

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174055
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AAD51927

<400> 174055
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccagc 300

cccgccaacg accugugcua ccccggcgac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ccaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcaac 420

cacgacgcca gcagcggcgu gagcagcgcc ugccccuacc acggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc cgagaucgcc accagaccca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacacccc ccagagagag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagcagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacaagugc gacaacgagu gcauggagag cgugaagaac 1500

ggcaccuacg acuaccccca guacagcgag gaggccagac ugaacagaga ggagaucagc 1560

ggcgugaagc uggagagcau gggcaccuac cagauccuga gcaucuacag caccguggcc 1620

agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174056
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AEO89181

<400> 174056
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagaacag cuggagcgac 420

cacgaggcca gccugggcgu gagcgccgcc ugccccuacc agggcaagag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gaagggcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgag 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca agaucaacgg ccagagcggc 720

agaaucgacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agguggagua cggcaacugc aacaccagau gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

aucgacaaga ugaacaccca guucgaggcc gugggcagag aguucaacaa ccuggagaga 1260

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agaaaccugu acgacaaggu gagacugcag cugaaggaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caucuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggugc uggccaucau gauggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 174057
<211> 1707

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AFM78567

<400> 174057
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccaccaacg accugugcua ccccggcagc uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc ugggcagccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcaccuacc ccaccaucaa gaagagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

agcagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacaagugc gacaacgagu gcauggagag caucagaaac 1500

ggcaccuaca acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

ggcgugaagc uggagagcau cggcaccuac cagauccuga gcaucuacag caccguggcc 1620

agcagccugg cccuggccau caugauggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174058
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ACR48872

<400> 174058
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccaccaacg accugugcua ccccggcagc uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc ugggcagccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcaccuacc ccaccaucaa gaagagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccaugcugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

agcagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

aacgccgagc ugcuggugcu gauggagaac gagagaaccc uggacuucca cgacagcaac 1380

gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacaagugc gacaacgagu gcauggagag caucagaaac 1500

ggcaccuaca acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

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agcagccugg cccuggccau caugauggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174059
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABW06108

<400> 174059
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccaccaacg accugugcua ccccggcagc uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc ugggcagccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcaccuacc ccaccaucaa gaagagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

agcagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacaagugc gacaacgagu gcauggagag caucagaaac 1500

ggcaccuaca acuaccccca guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

ggcgugaagc uggagagcau cggcaccuac cagauccuga gcaucuacag caccguggcc 1620

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agccugcagu gcagaaucug caucuga 1707

<210> 174060
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI341633

<400> 174060
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

cccaccaacg accugugcua ccccggcagc uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc ugggcagccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac agcaccuacc ccaccaucaa gaagaccuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccaccc caacaacggc 600

gccgagcaga ccaugcugua ccagaacccc accaccuaca ucagcaucgg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caugggcgcc 900

aucaacagca gcaugcccuu ccacaacauc caccccauca ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagagagag 1020

agcagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucag caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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gugaagaacc uguacgacaa ggugagacug cagcugagag acaacgccaa ggagcugggc 1440

aacggcugcu ucgaguucua ccacaagugc gacaacgagu gcauggagag caucagaaac 1500

ggcaccuaca acuacccccа guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

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agcagccugg cccuggccau caugaucgcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174061
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABD95991

<400> 174061
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

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cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174062
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGN69453

<400> 174062
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcgccggcgu gagcagcgcc ugccccuacc agggcaugag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccaagcugua ccagaacagc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaaucgagu ucuucuggac cauccugaag cccaacgaca ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcagcagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

agccugcagu gcagaaucug caucuga 1707

<210> 174063
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AGN69452

<400> 174063
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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcgccggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacagc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaaucgagu ucuucuggac cauccugaag cccaacgaca ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcagcagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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aacggcugcu ucgaguucua ccacagaugc gacaacgagu gcauggagag cgugagaaac 1500

ggcaccuacg acuacccccа guacagcgag gaggccagac ugaagagaga ggagaucagc 1560

ggcgugaagc uggagagcau cggcaccuac cagauccuga gcaucuacag caccguggcc 1620

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agccugcagu gcagaaucug caucuga 1707

<210> 174064
<211> 1707
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from hemagglutinin__InfluenzaA__ABD73284

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aucggcuacc acgccaacaa cagcaccgag cagguggaca ccaucaugga gaagaacgug 120

accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcgccggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcagcagacu ggugcuggcc accggccuga gaaacagccc ccagggcgag 1020

agaagaagaa agaagagagg ccuguucggc gccaucgccg gcuucaucga gggcggcugg 1080

cagggcaugg uggacggcug guacggcuac caccacagca acgagcaggg cagcggcuac 1140

gccgccgaca aggagagcac ccagaaggcc aucgacggcg ugaccaacaa ggugaacagc 1200

aucaucgaca agaugaacac ccaguucgag gccgugggca gagaguucaa caaccuggag 1260

agaagaaucg agaaccugaa caagaagaug gaggacggcu uccuggacgu guggaccuac 1320

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agcagccugg cccuggccau caugguggcc ggccugagcc uguggaugug cagcaacggc 1680

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<210> 174065
<211> 1695
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__ABF93440

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguuccu gaacgugccc gaguggagcu acaucgugga gaagaucaac 300

cccgccaacg accugugcua ccccggcaac uucaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcagaag cagcuucuuc 480

agaaacgugg uguggcugau caagaaggac aacgccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcuggug cugugggca uccaccaccc caacgacgcc 600

gccgagcaga ccagacugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggagu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga gaacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agcuggagua cggcaacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacagacu ggugcuggcc accggccuga gaaacagccc ccagaucgag 1020

accagaggcc uguucggcgc caucgccggc uucaucgagg gcggcuggca gggcauggug 1080

gacggcuggu acggcuacca ccacagcaac gagcagggca gcggcuacgc cgccgacaag 1140

gagagcaccc agaaggccau cgacggcgug accaacaagg ugaacagcau caucgacaag 1200

augaacaccc aguucgaggc cgugggcaga gaguucaaca accuggagag aagaaucgag 1260

aaccugaaca agaagaugga ggacggcuuc cuggacgugu ggaccuacaa cgccgagcug 1320

cuggugcuga uggagaacga gagaacccug gacuuccacg acagcaacgu gaagaaccug 1380

uacgacaagg ugagacugca gcugagagac aacgccaagg agcugggcaa cggcugcuuc 1440

gaguucuacc acagaugcga caacgagugc auggagagcg ugagaaacgg caccuacgac 1500

uacccccagu acagcgagga ggccagacug aagagagagg agaucagcgg cgugaagcug 1560

gagagcaucg gcaccuacca gauccugagc aucuacagca ccguggccag cagccuggcc 1620

cuggccauca ugguggccgg ccugagccug uggaugugca gcaacggcag ccugcagugc 1680

agaaucugca ucuga 1695

<210> 174066
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<212> RNA
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accgugaccc acgcccagga cauccuggag aagacccaca acggcagacu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagacc cugaucaucc ccaagagcag cuggcccaac 420

cacaccagca gcggcgugag cgccgccugc cccuaccagg gcacccccag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacgac gccuacccca ccaucaagau gagcuacaac 540

aacaccaaca gagaggaccu gcugauccug uggggcaucc accacagcaa caacgccgcc 600

gagcagacca accuguacaa gaaccccacc accuacguga gcgugggcac cagcacccug 660

aaccagagac uggugcccaa gaucgccacc agaagccagg ugaacggcca gagaggcaga 720

auggacuucu ucuggaccau ccugaagccc aacgacgcca uccacuucga gagcaacggc 780

aacuucaucg cccccgagua cgccuacaag aucgugaaga agggcgacag caccaucaug 840

aagagcgaga uggaguacgg ccacugcaac accaagugcc agacccccau cggcgccauc 900

aacagcagca ugcccuucca caacauccac ccccugacca ucggcgagug ccccaaguac 960

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agaagaaaga gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggcagggc 1080

augguggacg gcugguacgg cuaccaccac agcaacgagc agggcagcgg cuacgccgcc 1140

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uacgacuacc cccaguacag cgaggaggcc agacugaaga gagaggagau cagcggcgug 1560

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cuggcccugg ccaucaucgu ggccggccug agccugugga ugugcagcaa cggcagccug 1680

cagugcagaa ucugcaucug a 1701

<210> 174067
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AJS18479

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accgugaccc acgcccagga cauccuggag aagacccaca acggcagacu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagacc cugaucaucc ccaagagcag cuggcccaac 420

cacgagacca gccugggcgu gagcgccgcc ugccccuacc agggcaugcc cagcuucuuc 480

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agaauggacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agauggagua cggccacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

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gccgacagag agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

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cugcagugca gaaucugcau cuga 1704

<210> 174068
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI691378

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accgugaccc acgcccagga cauccuggag aagacccaca acggcagacu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagacc cugaucaucc ccaagagcag cuggcccaac 420

cacgagacca gccugggcgu gagcgccgcc ugccccuacc agggcgugcc cagcuucuuc 480

agaaacgugg uguggcugac caagaagaac gacgccuacc ccaccaucaa gaugagcuac 540

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agaauggacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agauggagua cggccacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

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<210> 174069
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI533583

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

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cacgagacca gccugggcgu gagcgccgcc ugccccuacc agggcacccc cagcuucuuc 480

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gccgagcaga ccaaccugua caagaacccc accaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagcc aggugaacgg ccagagaggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agauggagua cggccacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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ggcugcuucg aguucuacca caagugcgac aacaagugca uggagagcgu gagaaacggc 1500

accuacgacu acccccagua cagcgaggag gccagacuga agagagagga gaucagcggc 1560

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<210> 174070
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__AKS48023

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accgugaccc acgcccagga cauccuggag aagacccaca acggcagacu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

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auggacuucu ucuggaccau ccugaagccc aacgacgcca uccacuucga gagcaacggc 780

aacuucaucg cccccgagua cgccuacaag aucgugaaga agggcgacag caccaucaug 840

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cagugcagaa ucugcaucug a 1701

<210> 174071
<211> 1701
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI587621

<400> 174071

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accgugaccc acgcccagga cauccuggag aagacccaca acggcagacu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcaac cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagacc cugaucaucc ccaagagcag cuggcccaac 420

cacaccagca gcggcgugag cgccgccugc cccuaccagg gcaugcccag cuucuucaga 480

aacguggugu ggcugaccaa gaagaacgac gccuacccca ccaucaagau gagcuacaac 540

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gagcagacca accuguacaa gaaccccacc accuacguga gcgugggcac cagcacccug 660

aaccagagac uggagcccaa gaucgccacc agaagccagg ugaacggcca gagaggcaga 720

auggacuucu ucuggaccau ccugaagccc aacgacgcca uccacuucga gagcaacggc 780

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gugaagagca acaagcuggu gcuggccacc ggccugagaa acagcccccu gagagagaga 1020

agaagaaaga gaggccuguu cggcgccauc gccggcuuca ucgagggcgg cuggcagggc 1080

augguggacg gcugguacgg cuaccaccac agcaacgagc agggcagcgg cuacgccgcc 1140

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cuggcccugg ccaucaucgu ggccggccug agccugugga ugugcagcaa cggcagccug 1680

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<210> 174072
<211> 1704
<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AJE30333

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

aacggcguga agccccugau ccugaaggac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau cagagugccc gaguggagcu acaucgugga gagagccaac 300

cccgccaacg accugugcua ccccggcacc cugaacgacu acgaggagcu gaagcaccug 360

cugagcagaa ucaaccacuu cgagaagacc cugaucaucc ccagaagcag cuggcccaac 420

cacgagacca gccugggcgu gagcgccgcc ugccccuacc agggcgccag cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac gacgccuacc ccaccaucaa gaucagcuac 540

aacaacacca acagagagga ccugcugauc cugugggca uccaccacag caacaacgcc 600

gccgagcaga ccaaccugua caagaacccc gacaccuacg ugagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagcc aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccauccacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcaccauc 840

augaagagcg agauggagua cggccacugc aacaccaagu gccagacccc caucggcgcc 900

aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

uacgugaaga gcaacaagcu ggugcuggcc accggccuga gaaacagccc ccugagagag 1020

agaagaagaa agagaggccu guucggcgcc aucgccggcu ucaucgaggg cggcuggcag 1080

ggcauggugg acggcuggua cggcuaccac cacagcaacg agcagggcag cggcuacgcc 1140

gccgacaagg agagcaccca gaaggccauc gacggcguga ccaacaaggu gaacagcauc 1200

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aagaaccugu acgacaaggu gagacugcag cugagagaca acgccaagga gcugggcaac 1440

ggcugcuucg aguucuacca caagugcgac aacgagugca uggagagcgu gagaaacggc 1500

accuacgacu accccaagua cagcgaggag gccauccuga agagagagga gaucagcggc 1560

gugaagcugg agagcaucgg caccuaccag auccugagca ucuacagcac cguggccagc 1620

agccuggccc uggccaucau cguggccggc cugagccugu ggaugugcag caacggcagc 1680

cugcagugca gaaucugcau cuga 1704

<210> 174073
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<212> RNA
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accgugaccc acagcgugga gcugcuggag aaccagaagg agaagagauu cugcaagauc 180

augaacaagg ccccccugga ccugaaggac ugcaccaucg agggcuggau ccugggcaac 240

cccaagugcg accugcugcu gggcgaccag agcuggagcu acaucgugga gagacccaac 300

gcccagaacg gcaucugcua ccccggcgug cugaacgagc uggaggagcu gaaggccuuc 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca gcagaggcgu gaccaacgcc ugccccagcu acaccaucga cagcagcuuc 480

uacagaaacc ugguguggau cgugaagacc gacagcgcca ccuaccccgu gaucaagggc 540

accuacaaca acaccggcac ccagcccauc cuguacuucu ggggcgugca ccacccccug 600

gacaccaccg ugcaggacaa ccuguacggc agcggcgaca aguacgugag aaugggcacc 660

gagagcauga acuucgccaa gagccccgag aucgccgcca gacccgccgu gaacggccag 720

agaagcagaa ucgacuacua cuggagcgug cugagacccg gcgagacccu gaacguggag 780

agcaacggca accugaucgc ccccugguac gccuacaagu ucgugagcac caacaagaag 840

ggcgccgugu ucaagagcga ccugcccauc gagaacugcg acgccaccug ccagaccauc 900

accggcgugc ugagaaccaa caagaccuuc cagaacguga gcccccugug gaucggcgag 960

ugccccaagu acgugaagag cgagagccug agacuggcca ccggccugag aaacgugccc 1020

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ggcaugaucg acggcuggua cggcuaccac cacgagaaca gccagggcag cggcuacgcc 1140

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ggcugcuucg aguucuggca caagugcgac aacgagugca uggagagcgu gaagaacggc 1500

accuacgacu accccaagua ccagaaggag agcaagcuga acagacaggg caucgagagc 1560

gugaagcugg agaaccuggg cguguaccag auccuggcca ucuacagcac cgugagcagc 1620

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<210> 174074
<211> 1704
<212> RNA
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accgugaccc acagcgugga gcugcuggag aaccagaagg agaagagauu cugcaagauc 180

augaacaagg ccccccugga ccugaaggac ugcaccaucg agggcuggau ccugggcaac 240

cccaagugcg accugcugcu gggcgaccag agcuggagcu acaucgugga gagacccaac 300

gcccagaacg gcaucugcua ccccggcgug cugaacgagc uggaggagcu gaaggccuuc 360

aucggcagcg gcgagagagu ggagagauuc gagauguucc ccaagagcac cugggccggc 420

guggacacca gcagaggcgu gaccaacgcc ugccccagcu acaccaucga cagcagcuuc 480

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gacaccaccg ugcaggacaa ccuguacggc agcggcgaca aguacgugag aaugggcacc 660

gagagcauga acuucgccaa gagccccgag aucgccgcca gacccgccgu gaacggccag 720

agaagcagaa ucgacuacua cuggagcgug cugagacccg gcgagacccu gaacguggag 780

agcaacggca accugaucgc ccccugguac gccuacaagu ucgugagcac caacaagaag 840

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accuacgacu accccaagua ccagaaggag agcaagcuga acagacaggg caucgagagc 1560

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agccuggugc ugguggccu gaucauggcc aucggccugu ggaugugcag caacggcagc 1680

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<210> 174075
<211> 1692

<212> RNA
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hemagglutinin__InfluenzaA__ACZ36872

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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagac 300

ggcaacgacg ugugcuaccc cggcaaguuc gugaacggcg aggcccugag acagauccug 360

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aacggcacca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

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uuccacuggc ugauccugga cagcaacgac accgugaccu ucagcuucaa cggcgccuuc 780

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aucugcaucu ga 1692

<210> 174076
<211> 1692
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__AGB51388

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ggcaacgacg ugugcuaccc cggcaaguuc gugaacggcg aggcccugag acagauccug 360

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aucugcaucu ga 1692

<210> 174077
<211> 1683
<212> RNA
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hemagglutinin__InfluenzaA__EPI439507

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

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ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

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cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

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uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

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<210> 174078
<211> 1704
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI164216

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acgaguucau caacgugccc gaguggagcu acaucgugga gaaggccaac 300

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cugagcagaa ucaaccacuu cgagaagauc cagaucaucc ccaagagcag cuggagcgac 420

cacgaggcca gcagcggcgu gagcagcgcc ugccccuacc agggcacccc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagaagcuac 540

aacaacacca accaggagga ccugcugauc cugugggca uccaccacag caacgacgcc 600

gccgagcaga ccaagcugua ccagaacccc accaccuaca ucagcguggg caccagcacc 660

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agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

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<210> 174079
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI486492

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ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

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uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

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auggagaacc agcacaccau cgaccuggcc gacagcgaga uggacaagcu guacgagaga 1380

gugaagagac agcugagaga gaacgccgag gaggacggca ccggcugcuu cgagaucuuc 1440

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

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uga 1683

<210> 174080
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<212> RNA
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<220>
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacagcgg caucagaacc 420

aacggcguga ccagcgccug caagagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgccaucau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

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uuccacuggc ugauccugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgccaa gaccaaccag 1200

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

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uga 1683

<210> 174081
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

agcaagggca agagaaccgu ggaccugggc cagugcggcc ugcugggcac caucaccggc 240

ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agaaagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

cagguggacg ccgacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

agaagccugc ugcuggccac cggcaugaag aacgugcccg agauccccaa gggcagaggc 1020

cuguucggcg ccaucgccgg cuucaucgag aacggcuggg agggccugau cgacggcugg 1080

uacggcuuca gacaccagaa cgcccagggc gagggcaccg ccgccgacua caagagcacc 1140

cagagcgcca ucgaccagau caccggcaag cugaacagac ugaucgagaa gaccaaccag 1200

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cacaagugcg acgacgacug cauggccagc aucagaaaca acaccuacga ccacagcaag 1500

uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

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uga 1683

<210> 174082
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<212> RNA
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<220>
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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggagacc augggcuuca ccuacaacgg caucagaauc 420

aacggcguga ccagcgccug caagagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

agaaagagcc ccgccaucau cgugugggc auccaccaca gcgugagcac cgccgagcag 600

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uuccacuggc ugauccugaa ccccaacgac accgugaccu ucagcuucaa cggcgccuuc 780

aucgcccccg acagagccag cuuccugaga ggcaagagca ucggcaucca gagcggcgug 840

cagguggacg ccaacugcga gggcgacugc uaccacagcg gcggcaccau caucagcaac 900

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

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uga 1683

<210> 174083
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGL44438

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ggcguggagg uggugaacgc caccgagacc guggagagaa ccaacauccc cagaaucugc 180

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ccccccagu gcgaccaguu ccuggaguuc agcgccgacc ugaucaucga gagaagagag 300

ggcagcgacg ugugcuaccc cggcaaguuc gugaacgagg aggcccugag acagauccug 360

agagagagcg gcggcaucga caaggaggcc augggcuuca ccuacagcgg caucagaacc 420

aacggcgcca ccagcgccug cagaagaagc ggcagcagcu ucuacgccga gaugaagugg 480

cugcugagca acaccgacaa cgccgccuuc ccccagauga ccaagagcua caagaacacc 540

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aucgcccccg acagagccag cuuccugaga ggcaagagca ugggcaucca gagcggcgug 840

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cugcccuucc agaacaucga cagcagagcc gugggcaagu gccccagaua cgugaagcag 960

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uacagagagg aggccaugca gaacagaauc cagaucgacc ccgugaagcu gagcagcggc 1560

uacaaggacg ugauccugug guucagcuuc ggcgccagcu gcuucauccu gcuggccauc 1620

gugaugggcc ugguguucau cugcgugaag aacggcaaca ugagaugcac caucugcauc 1680

uga 1683

<210> 174084
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
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hemagglutinin__InfluenzaA__EPI445996

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cccagcgccg ugaacggcac cugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

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aaccuguaca ccagaaccga caccaccacc agcgugacca ccgagaaccu ggacagaacc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaucggcag aaucaacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacgu gcugagcggc gagagccacg gcagaauccu gaagaccaac 840

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uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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caggaggaga gcagacugga gagacagaag aucgagggca ucaagcugga gagcgagggc 1560

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uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

<210> 174085
<211> 1695
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI433309

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accgugaccc acgcccagga cauccuggag aagacccaca acggcaagcu gugcgaccug 180

gacggcguga agccccugau ccugagagac ugcagcgugg ccggcuggcu gcugggcaac 240

cccaugugcg acaaguucaa cgacgugccc gaguggagcu acaucgugga gaaggccaac 300

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cacgaggcca gccugggcgu gagcgccgcc ugccccuacc agggcaugcc cagcuucuuc 480

agaaacgugg uguggcugau caagaagaac aacaccuacc ccaccaucaa gagcagcuac 540

aacaacacca accaggagga ccugcugauc cugugggggca uccaccacag caacgacgag 600

gccgagcaga ccagacugua ccagaacagc aacaccuaca ucagcguggg caccagcacc 660

cugaaccaga gacuggugcc caagaucgcc accagaagca aggugaacgg ccagagcggc 720

agaauggacu ucuucuggac cauccugaag cccaacgacg ccaucaacuu cgagagcaac 780

ggcaacuuca ucgcccccga guacgccuac aagaucguga agaagggcga cagcgccauc 840

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aucaacagca gcaugcccuu ccacaacauc cacccccuga ccaucggcga gugccccaag 960

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<210> 174086
<211> 1683
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
hemagglutinin__InfluenzaA__EPI470859

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agcuucuuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acagcggcac cagcaaggcc ugcagcgaca gcuucuacag aagcaugaga 480

uggcugaccc agaagaacaa cgccuacccc auccaggacg cccaguacac caacaacaga 540

ggcaagagca uccuguucau gugggcauc aaccaccccc ccaccgacac cgcccagacc 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggacau caacagaacc 660

uucaagcccg ugaucggccc cagaccccug gugaacggcc ugcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

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uga 1683

<210> 174087
<211> 1683
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aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acaacggcac cagcaaggcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugacca gaaagaacgg cgacuacccc auccaggacg ugcaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagagag gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

aagagagccc ugggcagcaa cgccguggag gacggcaagg gcugcuucga gcuguaccac 1440

aagugcgaca accagugcau ggagaccauc agaaacggca ccuacaacaa gagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

uucgccgccu uccuguucug ggccaugagc aacggcagcu gcagaugcaa caucugcauc 1680

uga 1683

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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__AGO17847

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aacgugcccg ugacccacgc caaggagcug cugcagaccg agcacaacgg caugcugugc 180

gccaccaacc ugggccaccc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gcugcuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggcac cugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

acccuguuca gcagcgccag cagcuaccag agaauccaga ucuuccccga caccaccugg 420

aacgugaccu acaccggcac cagcagaagc ugcagcggca gcuucuacag aagcaugaga 480

uggcugaccc agaagagcgg cuucuacccc gugcaggacg ccaaguacac caacaacaga 540

ggcaagaaca uccuguucgu gugggcauc caccaccccc acaccuacac cgaccagacc 600

acccuguaca ucagaaacga caccaccacc agcgugacca ccgaggagcu gaacagaauc 660

uucaagcccg ugaucgugcc cagacugcug gugaacggcc agcagggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaguga gaagcaacgg caaccugauc 780

gccccuggu acggccacgu gcugagcggc ggcagccacg gcagaauccu gaagaccgac 840

cugaagagcg gcaacugcgu ggugcagugc cagaccgaga agggcggccu gaacagcacc 900

cugcccuucc acaacaucag caaguacgcc uucggcaccu gccccaagua cgugaaggug 960

aacagccuga agcuggccau cggccugaga aacgugcccg ccagaagcaa cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggcccg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccgugg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacgugugg gccuacaacg ccgagcugcu ggugcugcug 1320

gagaaccaga agacccugga cgagcacgac gccaacguga acaaccugua caacaaggug 1380

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aagugcgacg accagugcau ggagaccauc agaaacggca ccuacgacag aagaaaguac 1500

agagaggaga gcagacugga gagacagaga aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__ANZ03807

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gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gagccuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acgacggcac cagcaccgcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugacca gaaagaacgg cgacuacccc acccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacga cacccagaga 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagagag gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

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uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagugcaacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 174090
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<212> RNA
<213> Artificial Sequence

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hemagglutinin__InfluenzaA__EPI680526

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aacgugcccg ugacccacgc caaggagcug cugcacaccg agcacaacgg caugcugugc 180

gccaccagcc ugggccagcc ccugauccug gacaccugca ccaucgaggg ccugaucuac 240

ggcaacccca gcugcgaccu gagccuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acgacggcac cagcaccgcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugacca gaaagaacgg cgacuacccc acccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacga cacccagaga 600

aaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu acggccacau ccugagcggc gagagccacg gcagaauccu gaagaccgac 840

cugaagagag gcagcugcac cgugcagugc cagaccgaga agggcggccu gaacaccacc 900

cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

uucggcgcca ucgccggcuu caucgagggc ggcuggagcg gccugguggc cggcugguac 1080

ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

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aagaucgacg accagaucca ggacaucugg gccuacaacg ccgagcugcu ggugcugcug 1320

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aagugcaacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 174091
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<212> RNA
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hemagglutinin__InfluenzaA__ALT20080

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ggcaacccca gcugcgaccu gagccuggag ggcagagagu ggagcuacau cguggagaga 300

cccagcgccg ugaacggccu gugcuacccc ggcaacgugg agaaccugga ggagcugaga 360

agccuguuca gcagcgccag aagcuaccag agaauccaga ucuuccccga caccaucugg 420

aacgugagcu acgacggcac cagcaccgcc ugcagcggca gcuucuacag aagcaugaga 480

uggcugacca gaaagaacgg cgacuacccc auccaggacg cccaguacac caacaaccag 540

ggcaagaaca uccuguucau gugggcauc aaccaccccc ccaccgacac cacccagaga 600

gaccuguaca ccagaaccga caccaccacc agcguggcca ccgaggagau caacagaauc 660

uucaagcccc ugaucggccc cagaccccug gugaacggcc ugaugggcag aaucgacuac 720

uacuggagcg ugcugaagcc cggccagacc cugagaauca agagcgacgg caaccugauc 780

gcccccuggu ucggccacau ccugagcggc gagagccacg gcagaauccu gaagaccaac 840

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cugcccuucc agaacgugag caaguacgcc uucggcaacu gcagcaagua caucggcauc 960

aagagccuga agcuggccgu gggccugaga aacgugccca gcagaagcag cagaggccug 1020

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ggcuuccagc acagcaacga ccagggcgug ggcauggccg ccgacagaga cagcacccag 1140

aaggccaucg acaagaucac cagcaaggug aacaacaucg uggacaagau gaacaagcag 1200

uacgagauca ucgaccacga guucagcgag guggagacca gacugaacau gaucaacaac 1260

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aagagagccc ugggcagcaa cgccguggag gacggcaagg gcugcuucga gcuguaccac 1440

aagugcgacg accagugcau ggagaccauc agaaacggca ccuacaacag aagaaaguac 1500

caggaggaga gcaagcugga gagacagaag aucgagggcg ugaagcugga gagcgagggc 1560

accuacaaga uccugaccau cuacagcacc guggccagca gccuggugau cgccaugggc 1620

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uga 1683

<210> 174092
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<212> RNA
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neuraminidase__InfluenzaA__AAA43084

<400> 174092
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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

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<210> 174093
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAA43397

<400> 174093
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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcaaccaga accacaccgg caucugcaac cagggcagca ucaccuacaa gguggugggcc 180

ggccaggaca gcaccagcgu gauccugacc ggcaacagca gccugugccc caucagaggc 240

ugggccaucc acagcaagga caacggcauc agaaucggca gcaagggcga cguguucgug 300

aucagagagc ccuucaucag cugcagccac cuggagugca gaaccuucuu ccugacccag 360

ggcgcccugc ugaacgacaa gcacagcaga ggcaccuuca aggacagaag ccccuacaga 420

gcccugauga gcugccccgu gggcgaggcc cccagccccu acaacagcag auucgagagc 480

guggccugga gcgccagcgc cugccacgac ggcgugggcu ggcugaccau cggcaucagc 540

ggccccgacg acggcgccgu ggccgugcug aaguacaaca gaaucaucac cgagaccauc 600

aagagcugga gaaagaacau ccugagaacc caggagagcg agugcaccug cgugaacggc 660

agcugcuuca ccaucaugac cgacggcccc agcgacggcc uggccagcua caagaucuuc 720

aagaucgaga agggcaaggu gaccaagagc aucgagcuga acgcccccaa cagccacuac 780

gaggagugca gcugcuaccc cgacaccggc aaggugaugu gcgugugcag agacaacugg 840

cacggcagca acagacccug ggugagcuuc gaccagaacc uggacuacaa gaucggcuac 900

aucugcagcg gcguguucgg cgacaacccc agacccaagg acggcaccgg cagcugcggc 960

cccgugagcg ccgacggcgc caacggcgug aagggcuuca gcuacaagua cggcaacggc 1020

guguggaucg gcagaaccaa gagcgacagc agcagacacg gcuucgagau gaucugggac 1080

cccaacggcu ggaccgagac cgacagcaga uucagcauga gacaggacgu gguggccauc 1140

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ugcaugagac ccugcuucug gguggagcug aucagaggcc ugcccgagga ggacgccauc 1260

uggaccagcg gcagcaucau cagcuucugc ggcgugaaca gcgacaccgu ggacuggagc 1320

uggcccgacg gcgccgagcu gcccuucacc aucgacaagu ga 1362

<210> 174094
<211> 1365
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAA43412

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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagaacauca ucaccuacaa gaacagcacc 180

ugggugaagg acaccaccag cgugauccug accggcaaca gcagccugug ccccaucaga 240

ggcugggcca ucuacagcaa ggacaacagc aucagaaucg gcagcaaggg cgacguguuc 300

gugaucagag agcccuucau cagcugcagc caccuggagu gcagaaccuu cuuccugacc 360

cagggcgccc ugcugaacga cagacacagc aacggcaccg ugaaggacag aagccccuac 420

agagcccuga ugagcugccc cgugggcgag gcccccagcc ccuacaacag cagauucgag 480

agcguggccu ggagcgccag cgccugccac gacggcaugg gcuggcugac caucggcauc 540

agcggccccg acaacggcgc cguggccgug cugaaguaca acggcaucau caccgagacc 600

aucaagagcu ggagaaagaa gauccugaga acccaggaga gcgagugcgc cugcgugaac 660

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ggcgugugga ucggcagaac caagagccac agcagcagac acggcuucga gaugaucugg 1080

gaccccaacg gcuggaccga gaccgacagc aaguucagcg ugagacagga cgugguggcc 1140

augaccgacu ggagcggcua cagcggcagc uucgugcagc accccgagcu gaccggccug 1200

gacugcauca gacccugcuu cugggugggag cugaucagag gcagacccaa ggagaagacc 1260

aucuggacca gcgccagcag caucagcuuc ugcggcguga acagcgacac cguggacugg 1320

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<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAG01743

<400> 174095

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gagugcgacu accccgccaa caaccaggcc augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggaggu gugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu gaaggacuac agcaucaaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacaacgac agaagcagca gcagcuacug ccagaacccc 1020

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uggaugggca gaaccaucag cgaggacagc agaagcggcu acgagaccuu caaggugauc 1140

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaacaucau gcccaucuga 1410

<210> 174096

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAG01759

<400> 174096
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug auccugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acaagaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugcugggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agaagcagca gcagcaacug ccugaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174097
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAG01777

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug auccugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acaagaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugcugggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agaagcagca gcagcaacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcgacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174098
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAG01786

<400> 174098
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug auccugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acaagaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugcugggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agaagcagca gcagcaacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcgacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174099
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAK71688

<400> 174099
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug auccugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac gccaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcgacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174100
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAN01169

<400> 174100
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174101
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01170

<400> 174101
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174102
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01171

<400> 174102
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac ggcagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174103
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01172

<400> 174103
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174104
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAN01173

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaaguuc agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174105
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01174

<400> 174105

augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174106
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAN01175

<400> 174106
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaaguuc agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174107
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01176

<400> 174107
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaaguuc agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174108
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01177

<400> 174108
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174109
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01178

<400> 174109
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174110
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01179

<400> 174110
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaaguuc agaagcggcu acgagaccuu caaggugauc 1140

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174111
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01180

<400> 174111
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174112
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01181

<400> 174112
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174113
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01182

<400> 174113
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174114
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01183

<400> 174114
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174115
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01184

<400> 174115
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaaguuc agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174116
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAN01185

<400> 174116
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaaguuc agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174117
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01186

<400> 174117
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaaguuc agacugggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagagcaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174118
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01187

<400> 174118
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gaugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174119
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN01188

<400> 174119
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaaguuc agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174120
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN64883

<400> 174120
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg cgacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174121
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAN64884

<400> 174121
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174122
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAN64885

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174123
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAN64886

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174124
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAN64887

<400> 174124
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
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ugcuuccuga ugcagaucgu gauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174126
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAN64889

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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neuraminidase__InfluenzaA__AAN64890

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggag augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174128
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAN64891

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174129
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46212

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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgacaccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga ccccaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAO46213

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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAO46214

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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

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<220>
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neuraminidase__InfluenzaA__AAO46215

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gagugcgaca gccccaccag caaccaggug augcccugcg agcccaucau caucgagaga 180

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uggaugggca gaaccaucag caaggagagc agaagcggcu acgagaccuu caaggugauc 1140

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aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga ccccaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

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<212> RNA
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neuraminidase__InfluenzaA__AAO46216

<400> 174133
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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccag caagugcuac caguucgccc ugggccaggg caccacccug 420

gagaacaagc acagcaacgg caccaagcac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgagggcaga cugguggaca gcaucgugag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga ccccaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174134
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAO46217

<400> 174134
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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccag caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cuggaggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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uggaugggca gaaccaucag caaggaccug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagagc caggugaaca gacaggugau cguggacaac 1200

aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga agccaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174135
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAO46218

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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cuggaggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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cugguggggcg acacccccag aaacgacgac agcagcagca acagcaacug cagagacccc 1020

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ugcuucuacg uggagcugau cagaggcaga agccaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174136
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46220

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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gccguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaucug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

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cccgugaucg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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ugcuucuacg uggagcugau cagaggcaga cagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174137
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46221

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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gccgccgagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaucug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga cagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174138
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__AAO46223

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccgacgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccgugaucg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

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<211> 1410

<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46224

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46225

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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucacca agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174141
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAO46226

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcgccaaca ucaacuucau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAO46229

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174152
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAO46245

<400> 174152
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gacugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgu gaagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccgugcac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccuggccggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174153
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAO46246

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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaucaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ccguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174154
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46247

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccgugaucg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174155
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46462

<400> 174155
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174156
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46463

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174157
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46464

<400> 174157
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174158
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAO46465

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

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gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174159
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46466

<400> 174159

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

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gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174160
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAO46467

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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

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augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

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uggaugggca gaaccaucag caaggaccug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174161
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAO46468

<400> 174161
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgacu uccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

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uggaugggca gaaccaucag caaggaccug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174162
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAO46469

<400> 174162
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

aacaacgaga gaggcaacca gggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

uggaugggca gaaccaucag caaggaccug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174163
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46471

<400> 174163
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

aacaacgaga gaggcaacca gggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

uggaugggca gaaccaucag caaggaccug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174164
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAO46472

<400> 174164
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucac caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

aacaacgaga gaggcaacca gggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

uggaugggca gaaccaucag caaggaccug agaagcggcu acgagaccuu caaggugauc 1140

agcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174165
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAO46473

<400> 174165
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

aacaacgaga gaggcaacca gggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

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ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174166
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46474

<400> 174166
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

aacaacgaga gaggcaacca gggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174167
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46475

<400> 174167
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174168
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46476

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu cagacaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

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ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46477

<400> 174169
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174170
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46478

<400> 174170
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccagcag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagac cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

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cccaucgugg acaucaacau gaaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174171
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAO46479

<400> 174171
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caacagagug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

aacaacgaga gaggcaacca gggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

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ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174172
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46481

<400> 174172
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu gaaggacuac agcaucgaca gcagauacgu gugcagcggc 960

cugguggggcg acacccccag aaacaacgac agaagcagca acagcaacug cagaaacccc 1020

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174173
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46482

<400> 174173
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaugau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccguggugg acaucaacgu gaaggacuac agcaucgaca gcagauacgu gugcagcggc 960

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ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174174
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46483

<400> 174174
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccgug 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu cagacaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacaacgac agaagcagca acagcaacug cagaaacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174175
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAO46485

<400> 174175
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

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cugugggcg acacccccag aaacaacgac agaagcagca acagcaacug cagaaacccc 1020

aacaacgaca agggcaacca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag caaggacagc agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174176
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAO46486

<400> 174176
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174177
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46489

<400> 174177
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174178
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46491

<400> 174178
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

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augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174179
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO46492

<400> 174179
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccguggugg acaucaacgu gaaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaacaacgac agaagcagca acagcuacug cagaaacccc 1020

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uggaugggca gaaccaucag cgaggacagc agaagcggcu acgagaccuu caaggugauc 1140

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174180
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAO88264

<400> 174180
augaacacca accagagaau caucaccauc ggcaccgugu gccugaucgu gggcaucgug 60

agccugcugc ugcagaucgg caacaucgug agccugugga ucagccacag cauccagacc 120

ggcaagaaga acuacagcaa gaucugcagc aagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaucaaca ucgccgacgg ccagggcgug 240

aacagcauca uccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgaca ucuucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacagac acagcaacgg caccgugaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaagaucc ugagaaccca ggagagcgag ugcgugugca ucaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 780

ggcaagauca ucaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcaa gguggugugc gugugcagcg acaacuggca cgccagcaac 900

agacccuggg ugagcuucga ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag aagcaacgac ggcagaggca acugcggccc cgugcugagc 1020

aacggcgcca acggcgugaa gggcuucagc uucagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gcaugaacug caucagaccc 1260

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agcagcauca gcuucugcgg cguggacagc gagaccgcca gcuggagcug gcccgacggc 1380

gccgaccugc ccuucaccau cgacaaguga 1410

<210> 174181
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAQ10334

<400> 174181
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174182
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAQ10335

<400> 174182
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174183
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAQ10336

<400> 174183
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaga ucaaccugau gcccaucuga 1410

<210> 174184
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAQ10337

<400> 174184
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174185
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAQ10339

<400> 174185
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174186
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAQ10341

<400> 174186
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174187
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAQ10343

<400> 174187
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg uggccuucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174188
<211> 1191
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAQ10344

<400> 174188
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gagugcaaca gcccccccaa caaccaggcc augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gcaagagcug a 1191

<210> 174189
<211> 1416
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAR11366

<400> 174189
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aaccugcuga ucggcaucag caacgugggc cugaacguga gccugcaccu gaaggagaag 120

ggccccaagc aggaggagaa ccugaccugc accaccauca accagaacaa caccaccgug 180

guggagaaca ccuacgugaa caacaccacc aucaucacca agggcaccga ccugaagacc 240

cccagcuacc ugcugcugaa caagagccug ugcaacgugg agggcugggu ggugaucgcc 300

aaggacaacg ccgugagauu cggcgagagc gagcagauca ucgugaccag agagcccuac 360

gugagcugcg accccaccgg cugcaagaug uacgcccugc accagggcac caccaucaga 420

aacaagcaca gcaacggcac cauccacgac agaaccgccu ucagaggccu gaucagcacc 480

ccccugggca cccccccccac cgugagcaac agcgacuuca ugugcguggg cuggagcagc 540

accaccugcc acgacggcau cgccagaaug accaucugca uccagggcaa caacgacaac 600

gccaccgcca ccguguacua caacagaaga cugaccacca ccaucaagac cugggccaga 660

aacauccuga gaacccagga gagcgagugc gugugccaca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cagccaggcc uacaccaagg ugauguacuu ccacaagggc 780

cugugguga aggaggagga gcugagaggc agcgccagac acaucgagga gugcagcugc 840

uacggccaca accagaaggu gaccugcgug ugcagagaca acuggcaggg cgccaacaga 900

cccaucaucg agaucgacau gaacacccug gagcacacca gcagauacgu gugcaccggc 960

auccugaccg acaccagcag acccggcgac aagagcagcg gcgacugcag caaccccauc 1020

accggcagcc ccggcgcccc cggcgugaag ggcuucggcu uccugaacgg cgacaacacc 1080

uggcugggca gaaccaucag ccccagaagc agaagcggcu ucgagaugcu gaagaucccc 1140

aacgccggca ccgaccccaa cagcagaauc gccgagagac aggagaucgu ggacaacaac 1200

aacuggagcg gcuacagcgg cagcuucauc gacuacugga acgacaacag cgagugcuac 1260

aaccccugcu ucuacgugga gcugaucaga ggcagacccg aggaggccaa guacgugugg 1320

uggaccagca acagccugau cgcccugugc ggcagccccu uccccguggg ccccggcagc 1380

uuccccgacg gcgcccagau ccaguacuuc agcuga 1416

<210> 174190
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAS89005

<400> 174190
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agccugaugc ugcagaucgg caaccugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc agaaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacagc 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 900

guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagcagc 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

aucgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 174191
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAS89006

<400> 174191
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agccugaugc ugcagaucgg caaccugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc acaaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 900

guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagcagc 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 174192
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAT38822

<400> 174192
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gcccuguuca ucggcguggg caaccuggug uucaacaccg ugauccacga gaagaucggc 120

gaccaccaga ucgugaccca ccccaccauc augacccccg aggugcccaa cugcagcgac 180

accaucauca ccuacaacaa caccgugauc aacaacauca ccaccaccau caucaccgag 240

gccgagagac ccuucaagag cccccugccc cugugccccu ucagaggcuu cuuccccuuc 300

cacaaggaca acgccaucag acugggcgag aacaaggacg ugaucgugac cagagagccc 360

uacgugagcu gcgacaacga caacugcugg agcuucgccc uggcccaggg cgcccugcug 420

ggcaccaagc acagcaacgg caccaucaag gacagaaccc ccuacagaag ccugaucaga 480

uuccccaucg gcaccgcccc cgugcugggc aacuacaagg agaucugcau cgccuggagc 540

agcagcagcu gcuucgacgg caaggagugg augcacgugu gcaugaccgg caacgacaac 600

gacgccagcg cccagaucau cuacggcggc agaaugaccg acagcaucaa gagcuggaga 660

aaggacaucc ugagaaccca ggagagcgag ugccagugca ucgacggcac cugcguggug 720

gccgugaccg acggccccgc cgccaacagc gccgaccaca gaguguacug gaucagagag 780

ggcagaauca ucaaguacga gaacgugccc aagaccaaga uccagcaccu ggaggagugc 840

agcugcuacg uggacaucga cguguacugc aucugcagag acaacuggaa gggcagcaac 900

agacccugga ugagaaucaa caacgagacc auccuggaga ccggcuacgu gugcagcaag 960

uuccacagcg acacccccag acccgccgac cccagcauca ugagcugcga cagccccagc 1020

aacgugaacg gcggccccgg cgugaagggc uucggcuuca aggccggcaa cgacgugugg 1080

cugggcagaa ccgugagcac cagcggcaga agcggcuucg agaucaucaa ggugaccgag 1140

ggcuggauca acagccccaa ccacgugaag agcaucaccc agacccuggu gagcaacaac 1200

gacuggagcg gcuacagcgg cagcuucauc gugaaggcca aggacugcuu ccagcccugc 1260

uucuacgugg agcugaucag aggcagaccc aacaagaacg acgacgugag cuggaccagc 1320

aacagcaucg ugaccuucug cggccuggac aacgagcccg gcagcggcaa cuggcccgac 1380

ggcagcaaca ucggcuucau gcccaaguga 1410

<210> 174193
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAV65827

<400> 174193
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agccugaugc ugcagaucgg caaccugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc acaaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 900

guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagcagc 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 174194
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX11488

<400> 174194
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

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aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcgc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174195
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX11508

<400> 174195

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174196

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX11538

<400> 174196
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacaacggcc acagcaacga caccgugcac gagagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174197
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX11548

<400> 174197
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174198
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX11558

<400> 174198
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174199
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX11568

<400> 174199
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcuaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174200
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX11578

<400> 174200
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174201
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX11588

<400> 174201
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc aucugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggagaaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174202
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX11598

<400> 174202
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174203
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX11608

<400> 174203
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174204
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX11618

<400> 174204
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcgc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174205
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX12744

<400> 174205

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174206
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX12754

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174207
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX12774

<400> 174207
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__AAX12804

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac aacuucagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174209
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAX12814

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucguga acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174210
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX34064

<400> 174210
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agagagagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174211
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX35824

<400> 174211
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccuggccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174212
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX35834

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174213
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX35844

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca acagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174214
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX35854

<400> 174214
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174215
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX35864

<400> 174215
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174216
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX47538

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg aggaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174217
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX56383

<400> 174217
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174218
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX56393

<400> 174218
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggcaaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174219
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX56413

<400> 174219
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174220
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX56423

<400> 174220
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174221
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX56433

<400> 174221
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174222
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX56443

<400> 174222
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174223
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX56473

<400> 174223
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagaacug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174224
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX56483

<400> 174224
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174225
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX56503

<400> 174225
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174226
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX56513

<400> 174226
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174227
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX56533

<400> 174227
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcaugaag caggacgugg uggccaugaa cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174228
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX56543

<400> 174228
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc agcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174229
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX56553

<400> 174229
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174230
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX56563

<400> 174230
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcgc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174231
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX56573

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cuggugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174232
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX56583

<400> 174232
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174233
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX56593

<400> 174233
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174234
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX56603

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgcccac gacagaaccc ccuacagaac ccugcugaug 480

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174235
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX57647

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174246
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAX57757

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAX57767

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAX57777

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc aacaccaaga uccuguucau cgaggagggc 780

aagaucguga acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX57797

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX57807

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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neuraminidase__InfluenzaA__AAX57817

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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<220>
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neuraminidase__InfluenzaA__AAX57837

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174255
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX57857

<400> 174255
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccac caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174256
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX57867

<400> 174256
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174257
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX57877

<400> 174257
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcacaucuga 1410

<210> 174258
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX57887

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174259
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX57897

<400> 174259

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174260
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAX57907

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174261
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX57917

<400> 174261
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX57927

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174263
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAX57937

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agauggugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gagaaucuga 1410

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neuraminidase__InfluenzaA__AAX57947

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaga 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174265
<211> 1410
<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174266
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<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174267
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<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174268
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAX76666

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAX76696

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugagcgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgug ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__AAY18089

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gagugcaaca gccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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neuraminidase__InfluenzaA__AAY18099

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucgu ggaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174274
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY18109

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ugcuuccuga ugcagaucgc cauccuggug accacccuga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagaa gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucguga acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174275
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAY18119

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucguga acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174276
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAY18139

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agagagagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174278
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY18149

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174279
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAY18159

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagaacug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174280
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY18179

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174281
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY18189

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174282
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAY18199

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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gagugcgaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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<212> RNA
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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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<212> RNA
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neuraminidase__InfluenzaA__AAY27856

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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<220>
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neuraminidase__InfluenzaA__AAY27866

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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<220>
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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__AAY28268

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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<212> RNA
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucguga acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAY28318

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cagacccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucguga acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<220>
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neuraminidase__InfluenzaA__AAY28358

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174302
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAY28398

<400> 174302
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agagagagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174303
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY28408

<400> 174303

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gagugcgaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174304

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY28505

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174305
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY28524

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacua caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174306
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY28534

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174307
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY28544

<400> 174307
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccaa caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174308
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<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174309
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY28564

<400> 174309
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174310
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY28574

<400> 174310
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174311
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAY28584

<400> 174311
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucguga acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174312
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY28594

<400> 174312
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174313
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY28611

<400> 174313

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174314
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY28651

<400> 174314
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174315
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY44613

<400> 174315
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

aucgccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174316
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY44624

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucguga acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174317
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY44634

<400> 174317
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174318
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY44644

<400> 174318
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174319
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY44654

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174320
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY44758

<400> 174320
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccccagcaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcccgaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174321
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY44778

<400> 174321
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174322
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY44788

<400> 174322
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174323
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY44909

<400> 174323
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174324
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY45649

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174325
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY46374

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccua caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174326
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY46384

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga cgccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174327
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY46394

<400> 174327
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ugcuuccuga ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucgaccugau gcccaucuga 1410

<210> 174328
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY46419

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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY47016

<400> 174329
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc aacgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174330
<211> 1410
<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccuguu ccccaucuga 1410

<210> 174331
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAY47078

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174332
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAY47088

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174333
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAY58319

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY59038

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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aaggccuggc ugcacgugug cgugaccggc gacgacgaga acgccaccgc cagcuucauc 600

uacaacggca gacuggugga cagcaucggc agcuggagca agaagauccu gagaacccag 660

gagagcgagu gcgugugcau caacggcacc ugcaccgugg ugaugaccga cggcagcgcc 720

agcggcaagg ccgacaccaa gauccuguuc aucgaggagg gcaagaucgu gcacaccagc 780

ccccugagcg gcagcgccca gcacguggag gagugcagcu gcuaccccag auaccccggc 840

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agcgagaagc ugagaagcgg cuacgagacc uucaagguga ucgagggcug gagcaagccc 1140

aacagcaagc ugcagaucaa cagacaggug aucguggaca gaggcaacag aagcggcuac 1200

agcggcaucu ucagcgugga gggcaagagc ugcaucaaca gaugcuucua cguggagcug 1260

aucagaggca gaaagcagga gaccgaggug cuguggacca gcaacagcau cgugguguuc 1320

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<220>
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neuraminidase__InfluenzaA__AAY64195

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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aagcaggagg ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<220>
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neuraminidase__InfluenzaA__AAY64205

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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<220>
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neuraminidase__InfluenzaA__AAY64215

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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<220>
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neuraminidase__InfluenzaA__AAY64225

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga acgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174339
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<220>
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neuraminidase__InfluenzaA__AAY64245

<400> 174339
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174340
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAY64255

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174341
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY64265

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174342
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY64285

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174343
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY64295

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugagcgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY64305

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174345
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY64335

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAY64365

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agagagagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174347
<211> 1410

<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY64385

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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174350
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<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__AAY98070

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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neuraminidase__InfluenzaA__AAY98090

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cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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neuraminidase__InfluenzaA__AAY98100

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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174358

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY98120

<400> 174358
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174359
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY98130

<400> 174359
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174360
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY98150

<400> 174360
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174361
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY98160

<400> 174361
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc aacgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagcaacug ccugaacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174362
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY98170

<400> 174362
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174363
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY98180

<400> 174363
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174364
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY98200

<400> 174364
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174365
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAY98210

<400> 174365
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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174366
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 174366
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174367
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 174367

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

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augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174368
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174369
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY98322

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

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augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174370
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174371
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY98342

<400> 174371
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174372
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY98359

<400> 174372
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY98369

<400> 174373
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174374
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY98379

<400> 174374
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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174375
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAY98389

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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

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<212> RNA
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neuraminidase__InfluenzaA__AAZ32957

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accgagaucg uguaccugac caacaccacc aucgagaagg agaucugccc caagcuggcc 180

gaguacagaa acuggagcaa gccccagugc aacaucaccg gcuucgcccc cuucagcaag 240

gacaacagca ucagacugag cgccggcggc gacaucuggg ugaccagaga gcccuacgug 300

agcugcgacc ccgacaagug cuaccaguuc gcccugggcc agggcaccac ccugaacaac 360

gugcacagca acgacaccgu gcacgacaga acccccuaca gaacccugcu gaugaacgag 420

cugggcgugc ccuuccaccu gggcaccaag caggugugca ucgccuggag cagcagcagc 480

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gccagcuuca ucuacaacgg cagacuggug gacagcaucg ugagcuggag caagaagauc 600

cugagaaccc aggagagcga gugcgugugc aucaacggca ccugcaccgu ggugaugacc 660

gacggcaacg ccagcggcaa ggccgacacc aagauccugu ucaucgagga gggcaagauc 720

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uacguggagc ugaucagagg cagaaagcag gagaccgagg ugcuguggac cagcaacagc 1260

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<212> RNA
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accgagaucg uguaccugac caacaccacc aucgagaagg agaucugccc caagcuggcc 180

gaguacagaa acuggagcaa gccccagugc aacaucaccg gcuucgcccc cuucagcaag 240

gacaacagca ucagacugag cgccggcggc gacaucuggg ugaccagaga gcccuacgug 300

agcugcgacc ccgacaagug cuaccaguuc gcccugggcc agggcaccac ccugaacaac 360

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gccagcuuca ucuacaacgg cagacuggug gacagcaucg ugagcuggag caagaagauc 600

cugagaaccc aggagagcga gugcgugugc aucaacggca ccugcaccgu ggugaugacc 660

gacggcaacg ccagcggcaa ggccgacacc aagauccugu ucaucgagga gggcaagauc 720

gugcacacca gcacccugag cggcagcgcc cagcacgugg aggagugcag cugcuacccc 780

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uacguggagc ugaucagagg cagaaagcag gagaccgagg ugcuguggac cagcaacagc 1260

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accgagaucg uguaccugac caacaccacc aucgagaagg agaucugccc caagcuggcc 180

gaguacagaa acuggagcaa gccccagugc aacaucaccg gcuucgcccc cuucagcaag 240

gacaacagca ucagacugag cgccggcggc gacaucuggg ugaccagaga gcccuacgug 300

agcugcgacc ccgacaagug cuaccaguuc gcccugggcc agggcaccac ccugaacaac 360

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gccagcuuca ucuacaacgg cagacuggug gacagcaucg ugagcuggag caagaagauc 600

cugagaaccc aggagagcga gugcgugugc aucaacggca ccugcaccgu ggugaugacc 660

gacggcaacg ccagcggcaa ggccgacacc aagauccugu ucaucgagga gggcaagauc 720

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uacguggagc ugaucagagg cagaaagcag gagaccgagg ugcuguggac cagcaacagc 1260

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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neuraminidase__InfluenzaA__AAZ38476

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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ggcgccgaca ucaaccugau gcccaucuga 1410

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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174386
<211> 1410
<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174387
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAZ38586

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174388
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ38597

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174389
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ38608

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ccaaccugau gcccaucuga 1410

<210> 174390
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAZ38619

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174391
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAZ38641

<400> 174391
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ38653

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174393
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ43386

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gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174394
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAZ43397

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agagagagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174395
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ43408

<400> 174395
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau gaucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174396
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAZ74355

<400> 174396
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggcc augcccugcg agcccgccau caucgagaga 180

aacaccaccg agaccgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174397
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ74366

<400> 174397
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174398
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ74377

<400> 174398
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174399
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ74400

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gccugaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ74411

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174401
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ74422

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cccgccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174402
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ74444

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

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<220>
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neuraminidase__InfluenzaA__AAZ74455

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gaguucaaca gccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAZ74477

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174405
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAZ74488

<400> 174405
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174406
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ74499

<400> 174406
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174407
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ74510

<400> 174407
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174408
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ74521

<400> 174408
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174409
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__AAZ74532

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc aacgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 174410
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ74543

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174411
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ74565

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174412
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__AAZ74598

<400> 174412
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAZ74609

<400> 174413
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174414
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<212> RNA
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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174415
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<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucguga acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174416
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ79519

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174417
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ79530

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174418
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ79552

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc cccacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174419
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAZ79563

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ79585

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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAZ79618

<400> 174422
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

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aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
<213> Artificial Sequence

<220>

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<400> 174423

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174424

<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAZ79945

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174425
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAZ79966

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174426
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ79977

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAZ79988

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174428
<211> 1410
<212> RNA
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<220>
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gaguucaaca gcccccccaa caaccagaug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__AAZ80010

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

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cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAZ80021

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

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aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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<210> 174431
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAZ83245

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gaguucaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174433
<211> 1410
<212> RNA
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<220>
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<400> 174433

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174435
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__AAZ83291

<400> 174435
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174436
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__AAZ83302

<400> 174436
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

gccagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccacag cgagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174437
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ83315

<400> 174437
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc aacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174438
<211> 1410
<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174439
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ83374

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

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<210> 174440
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174441
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__AAZ85129

<400> 174441
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174442
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA06513

<400> 174442
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174443
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA06545

<400> 174443
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174444
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA08478

<400> 174444
augaacacca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174445
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA08511

<400> 174445
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174446
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA12699

<400> 174446
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174447
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA12710

<400> 174447
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174448
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA12721

<400> 174448
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucggcaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccagagac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174449
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA12732

<400> 174449
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174450
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA12743

<400> 174450
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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neuraminidase__InfluenzaA__ABA12786

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

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<212> RNA
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

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aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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uaccccagau accccggcau cagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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cuggugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174460
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABA26703

<400> 174460
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174461
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA26714

<400> 174461
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174462
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA26736

<400> 174462
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174463
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA26747

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174464
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA26758

<400> 174464
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174465
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA26769

<400> 174465
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABA26780

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174467
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA26791

<400> 174467
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174468
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA26802

<400> 174468
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174469
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42250

<400> 174469
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcgacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174470
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42261

<400> 174470
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174471
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42272

<400> 174471
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucaa cgagaagcug agacugggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174472
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42294

<400> 174472
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174473
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42305

<400> 174473
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174474
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA42316

<400> 174474
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174475
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42327

<400> 174475
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174476
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42338

<400> 174476
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174477
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA42349

<400> 174477

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gagugcgaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaag cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174478

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42360

<400> 174478
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174479
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42371

<400> 174479
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucguga acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174480
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42382

<400> 174480
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174481
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42393

<400> 174481
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174482
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA42404

<400> 174482
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucguga acaucagcac ccugcccggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174483
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42415

<400> 174483
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174484
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA42446

<400> 174484
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174485
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA42457

<400> 174485
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174486
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42468

<400> 174486
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174487
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42479

<400> 174487

augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

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aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg acggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174488
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA42490

<400> 174488
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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aagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174489
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42501

<400> 174489
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174490
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA42512

<400> 174490
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccccaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174491
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA42523

<400> 174491
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174492
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42534

<400> 174492
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174493
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA42545

<400> 174493
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174494
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42556

<400> 174494
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggagg ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174495
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA42567

<400> 174495
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174496
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42931

<400> 174496
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcagccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174497
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA42942

<400> 174497
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174498
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA42981

<400> 174498
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174499
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABA42992

<400> 174499
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucguga acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174500
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA43192

<400> 174500
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga uccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg ugagcaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174501
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA43203

<400> 174501
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcau cagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174502
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA43339

<400> 174502
augaacccca accagaagau caucaccauc ggcagcguga gccugagcau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcauggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agaagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174503
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA54916

<400> 174503
augaacccca accagaagau caucaccacc ggcagcaucu gcauggugau cggcauggug 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcacccagc acagagccga gcccugcaac agaagcauca ucaacuacga gaacaacacc 180

ugggugaacc agaccuacgu gaagaucagc aacaccaacu uccugaccga gaaggccgug 240

gccagcguga gacuggugggg caacagcagc cugugcccca ucagcggcug ggccguguac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagagccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gaucgagaag 780

ggcaaggugg ugaagagcgu ggagcugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagcccc 1020

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acagcaacuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 174504
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA87048

<400> 174504
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcgu ggagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174505
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA87060

<400> 174505
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcacc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcagccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174506
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA87083

<400> 174506
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagaagauca ucaccuacaa gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174507
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABA87234

<400> 174507
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ucaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174508
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02784

<400> 174508
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174509
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02795

<400> 174509
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174510
<211> 1413
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02806

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174511
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02817

<400> 174511
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcgu ggagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174512
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02828

<400> 174512
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcgu ggagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174513
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB02839

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug gugcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174514
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02850

<400> 174514
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cccgccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174515
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02861

<400> 174515
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174516
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABB02872

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174517
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02883

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174518
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02894

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agauggugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174519
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02905

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174520
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABB02916

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccagagac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174521
<211> 1413

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02927

<400> 174521
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174522
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABB02939

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

uggaugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau ggagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174523
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02950

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174524
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02961

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174525
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABB02972

<400> 174525
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174526
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02983

<400> 174526
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174527
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB02994

<400> 174527
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174528
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB03005

<400> 174528
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174529
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB03016

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174530
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB03027

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174531
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB03038

<400> 174531

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174532

<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB03049

<400> 174532
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB03060

<400> 174533
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174534
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB03071

<400> 174534
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcggca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaag 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174535
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB03093

<400> 174535
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174536
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB03104

<400> 174536
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174537
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB03115

<400> 174537
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga acgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174538
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB03126

<400> 174538
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174539
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB03148

<400> 174539
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174540
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB04286

<400> 174540
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174541
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB04297

<400> 174541

augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug auccccugcg agcccaucac caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu gaaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacaacgac agaagcagca acagcuacug cagaaacccc 1020

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174542
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB04319

<400> 174542
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174543
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB04341

<400> 174543
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcgugag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccguggugg acaucaacgu gaaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agaagcagca acagcuacug cagaaacccc 1020

aacaacgaga agggcaacca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggacagc agaagcggcu acgagaccuu caaggugauc 1140

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174544
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABB04352

<400> 174544
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacaagc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agaagcagca gcagcuacug cagaaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174545
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB04374

<400> 174545
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu gaaggacuac agcaucgaca gcagauacgu gugcagcggc 960

cugguggggcg acacccccag aaacaacgac aagagcagca acagcaacug cagaaacccc 1020

aacaacgaca agggcaacca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag caaggacagc agaagcggcu acgagaccuu caaggugauc 1140

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174546
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB04931

<400> 174546
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaacaacgac agaagcagca gcagcuacug cagaaacccc 1020

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174547
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB04942

<400> 174547
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agaagcagca gcagcuacug cagaaacccc 1020

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174548
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB04953

<400> 174548
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacaagc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174549
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB04975

<400> 174549
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174550
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB04986

<400> 174550
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174551
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB04997

<400> 174551
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugca ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugaa gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB05008

<400> 174552
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174553
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB05186

<400> 174553
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174554
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB05219

<400> 174554
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174555
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB46395

<400> 174555
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caagcaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

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cugguggggcg acacccccag aaacaacgac agaagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcaccca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggacagc agaagcggcu acgagaccuu caaggugauc 1140

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174556
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB46417

<400> 174556
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174557
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB46428

<400> 174557
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174558
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB46439

<400> 174558
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcgccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagaga 780

agaaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcaacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcgccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174559
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB46450

<400> 174559
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcau cagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174560
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB46461

<400> 174560
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174561
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB46550

<400> 174561
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

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aacauccuga gaacccagga gagcgagugc gugugcguga acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174562
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB51955

<400> 174562
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caucgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aaguucuuca gaacccagga gagcgagugc gugugcaucc acggcaccug caccguggug 720

augaccgacg gcagcgccag cagaaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174563
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB51956

<400> 174563
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga ccguggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcccaucc ugggcaccca ggagagcgag ugggugugcg ugaacggcag cugcuucacc 720

aucaugaccg acgaccccag cuacgaggcc gccagcuaca agaucuucaa gaucgagaga 780

gagagaguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174564
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB51957

<400> 174564
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagaucuuca gaacccagaa guucgagugc gugugcaucc acuggaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174565
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB51958

<400> 174565
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaagggca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu gggcaucggc 1080

agaaccauca gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174566
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB51959

<400> 174566
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac ggcagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucaa cgaggagggc 780

aagaucgugc acaccagcac cugcagcggc agcgcccagc acguggagga gugcagcugc 840

uacagcagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174567
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB51960

<400> 174567
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agccugaugc ugcagaucgg caacaucauc cccaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcgagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcugaac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacgaguacg gcaacggcga cuggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc cgacggcugg 1140

accgacacca acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggugug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174568
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB53617

<400> 174568
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174569
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABB53721

<400> 174569
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcagc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174570
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB53754

<400> 174570
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174571
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB54517

<400> 174571
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

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cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174572
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB59999

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugaccuucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174573
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB60010

<400> 174573
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gaguacagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174574
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABB77867

<400> 174574
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174575
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB79719

<400> 174575
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174576
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB79734

<400> 174576
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174577
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB79791

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174578
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB79802

<400> 174578
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174579
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB79813

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggaggu gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174580
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB79960

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggaggu gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174581
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB79971

<400> 174581
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggaggu gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174582
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB79982

<400> 174582
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174583
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB79993

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174584
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80004

<400> 174584
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174585
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB80015

<400> 174585

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcagc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174586

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80037

<400> 174586
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174587
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80048

<400> 174587
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174588
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80084

<400> 174588
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccccagcaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174589
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80095

<400> 174589
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174590
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB80162

<400> 174590
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174591
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB80199

<400> 174591
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174592
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80210

<400> 174592
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaaguuc agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucggccugau gcccaucuga 1410

<210> 174593
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80232

<400> 174593
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acuggccgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg cgacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174594
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB80243

<400> 174594
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagaaggaga acgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174595
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80254

<400> 174595

augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcggccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaucug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaaguuc agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174596
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB80495

<400> 174596
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg uggccuucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174597
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80506

<400> 174597
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174598
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB80517

<400> 174598
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174599
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80532

<400> 174599
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174600
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80644

<400> 174600
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaac 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174601
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80664

<400> 174601
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaagg ugcuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174602
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB80675

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acuggccgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg cgacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174603
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80685

<400> 174603
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ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174604
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80696

<400> 174604
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174605
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80707

<400> 174605
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcggccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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uggaugggca gaaccaucag cgagaaguuc agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174606
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80716

<400> 174606
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174607
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB80725

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccgu gaucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg uggccuucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174608
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80740

<400> 174608
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcugca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg uggccuucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174609
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB80751

<400> 174609
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174610
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB82186

<400> 174610
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcccgaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174611
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB82197

<400> 174611
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174612
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB82208

<400> 174612
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174613
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB82219

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcaaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacgccg ccgacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174614
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB82230

<400> 174614
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174615
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB83018

<400> 174615
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

ggcugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174616
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB83029

<400> 174616
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

ggcugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174617
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB83130

<400> 174617
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174618
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB83141

<400> 174618
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ugcuuccuga gccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174619
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB86876

<400> 174619
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agccugcugc ugcagaucgg caacaucgug agccugugga ucagccacag cauccagacc 120

ggcggcaaga accacagcga gaugugcaac cagaacguga ucaccuacgu gaacaacacc 180

ugggugaaca gaaccuacgu gaacaucagc aacaccaaca ucgccaccgu gcaggacgug 240

accagcguga uccuggccgg caacagcagc cugugcagcg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgaca ucuucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

gugcugaccg acggccccag caacggccag gccagcuaca agaucuucaa gguggagaag 780

ggcaagauca ucaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcaa ggugaugugc gugugcagag acaacuggca cgccagcaac 900

agacccuggg ugagcuucga ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag aagcaacgac ggcaagggca acugcggccc cgugcugagc 1020

aacggcgcca acggcgugaa gggcuucagc uucagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acagcagcuu cagcaugaag caggacauca ucgcccugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gcaugaacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggccag cccaaggaga gcaccaucug ggccagcggc 1320

agcagcauca gcuucugcgg cguggacagc gagaccacca gcuggagcug gcccgacggc 1380

gccgaccugc ccuucaccau cgacaaguga 1410

<210> 174620
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB86886

<400> 174620
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agccugcugc ugcagaucgg caacaucgug agccugugga ucagccacag cauccagacc 120

gaggagaaga accacagcga gaccugcagc cagaacuuca ucacccacga gaacaacacc 180

ugggugaacc agaccuacau caacaucagc aacaccaaca acguggugg ccagggcgug 240

accagcauca ugcuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgaca ucuucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccguguucaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaagaucc ugagaaccca ggagagcgag ugcgugugca ucaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 780

ggcaagauca ucaagagcgu ggagcuggac gcccccaacu accacuacga ggagagcagc 840

ugcuaccccg acaccggcaa gguggugugc gugugcagag acaacuggca cgccagcaac 900

agacccuggg ugagcuucga ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag aagcaacgac ggcaagggca acugcggccc cgugcugagc 1020

aacggcgcca acggcgugaa ggaggugagc uucagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

accgagaccg acagcagcuu cagcaucaag caggacauca ucgcccugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gcaugaacug caucaagccc 1260

ugcuucuggg uggagcugau cagaggccag cccaaggaga gcaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cguggacagc gagaccgcca gcuggagcug gcccgacggc 1380

gccgaccugc ccuucaccau cgacaaguga 1410

<210> 174621
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB86898

<400> 174621
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcag 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cuggugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcagcagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccaaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174622
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABB86906

<400> 174622
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agccugcugc ugcagaucgg caacaucgug agccugugga ucagccacag cauccagacc 120

ggcggcaaga accacagcga gaugugcaac cagaacguga ucaccuacgu gaacaacacc 180

ugggugaaca gaaccuacgu gaacaucagc aacaccaaca ucgccaccgu gcaggacgug 240

accagcguga uccuggccgg caacagcagc cugugcagcg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgaca ucuucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

gugcugaccg acggccccag caacggccag gccagcuacg agaucuucaa gguggagaag 780

ggcaagauca ucaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcaa ggugaugugc gugugcagag acaacuggca cgccagcaac 900

agacccuggg ugagcuucga ccagaaccug aacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag aagcaacgac ggcaagggca acugcggccc cgugcugagc 1020

aacggcgcca acggcgugaa gggcuucagc uucagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaagcggc uucgagaugg ugugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gagaccgcca gcuggagcug gcccgacggc 1380

gccgaccugc ccuucaccau cgacaaguga 1410

<210> 174623
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB86916

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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucagcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174624
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB86928

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcaucgagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccaaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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agccugcugc ugcagaucgg caacaucgug agccugugga ucaaccacag cauccagacc 120

gagggcaaga accacagcga gaugugcaac cagaacguga ucaccuacgu gaacaacacc 180

ugggugaaca gaaccuacgu gaacaucagc aacaccaaca ucgccaccgu gcaggacgug 240

accagcguga uccuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgaca ucuucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaga gacagaagcc ccuacagaac ccugaugagc 480

ugccccaccg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

gugcugaccg acggccccag caacggccag gccagcuaca agaucuucaa gguggagaag 780

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agacccugga ucuacuucga ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gagaccgcca acuggagcug gcccgacggc 1380

gccgaccugc ccuucaccau cgacaaguga 1410

<210> 174626
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB86947

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agccugcuga gccagaucgg caacaucgug agccugugga ucauccacag cauccagacc 120

ggcggcaaga accacagcga gaugugcaac cagaacguga ucaccuacgu gaacaacacc 180

ugggugaaca gaaccuacau caacaucagc aacaccaaca ucgccaccgu gaaggacgug 240

accagcguga uccuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgaca ucuucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

gugcugaccg acggccccag caacggccag gccagcuaca agaucuucaa gguggagaag 780

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agacccuggg ugagcuucga ccagaaccug gacuaccaga ugggcuacau cugcagcggc 960

guguucggcg acaaccccag aagcaacgac ggcaagggca acugcggccc cgugcugagc 1020

aacggcgcca acggcgugaa gggcuucagc uucagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gagaccgcca gcuggagcug gcccgacggc 1380

gccgaccugc ccuucaccau cgacaaguga 1410

<210> 174627
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB86957

<400> 174627
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agccugcugc ugcagaucgg caacaucgug agccugugga ucagccacag cauccagacc 120

ggcgagaaga accacagcga ggugugcaac cagaacauca ucaccuacga gaacaagacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaaca ucgccgaggg ccagggcgug 240

accagcauca ucauggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgaca ucuucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacagac acagcaacgg caccgugaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg cagcgacaac 600

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaagaucc ugagaaccca ggagagcgag ugcgugugca ucaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag aagcaacgac ggcaagggca acugcggccc cgugcccagc 1020

aacggcgcca acggcgugaa gggcuucagc uucagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucuucag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

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gccgaccugc ccuucaccau cgacaaguga 1410

<210> 174628
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABB96333

<400> 174628
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gacugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccguggugg acaucaacgu gaaggacuac agcaucgcca gcagcuacgu gugcagcggc 960

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uggaugggca gaaccaucag cgacgagagc agaagcggcu acgagaccuu caaggugauc 1140

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174629
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB96344

<400> 174629
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg cagaugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaagg ugcuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu gaaggacuac agcaucgcca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agauacagca gcagcuacug cagaaacccc 1020

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174630
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB96398

<400> 174630
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagac cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccguggugg acaucaacgu gaaggacuac agcaucgcca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agaagcagca gcagcuacug cagaaacccc 1020

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174631
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABB96490

<400> 174631
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174632
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB96501

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccag caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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uggaugggca gaaccaucag cgaggagagc agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174633
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABB96534

<400> 174633
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaaguuc agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC02237

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg uggccuucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174635
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC02258

<400> 174635
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccagauc augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac aucaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccag caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174636
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC02269

<400> 174636
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu gaaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacaacgac agaagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcaccca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggacagc agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagcug cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174637
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABC02280

<400> 174637
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cagccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174638
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC02302

<400> 174638
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174639
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC02313

<400> 174639

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gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagac cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu gaaggacuac agcaucgcca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agaagcagca gcagcuacug cagaaacccc 1020

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ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174640

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC02324

<400> 174640
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccagauc augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac aucaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccag caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu gaaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agaagcagca acagcuacug cagaaacccc 1020

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uggaugggca gaaccaucag cgaggacagc agaagcggcu acgagaccuu caaggugauc 1140

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcgccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174641
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC02335

<400> 174641
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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uggaugggca gaaccaucag cgaggacagc agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagcug cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174642
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC39808

<400> 174642
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccag caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174643
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC40525

<400> 174643
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174644
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC40536

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ucaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174645
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC40547

<400> 174645
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gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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ggcggcugga gcacccccaa cagcaagcug cagaucaaca gacaggugau cguggacagc 1200

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

agcauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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uggaugggca gaaccaucag cgaggagagc agaagcggcu acgagaccuu caaggugauc 1140

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABC40611

<400> 174647
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gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaaguuc agaagcggcu acgagaccuu caaggugauc 1140

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174648
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC40622

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcaacgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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uggaugggca gaaccaucag cgaggacagc agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagcug cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174649
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC40634

<400> 174649

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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcaucg acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174650
<211> 1410
<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174651
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC41706

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174652
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABC41717

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174653
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC41728

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174654
<211> 1410
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC41742

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174655
<211> 1410
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC41956

<400> 174655
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174656
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC41967

<400> 174656
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174657
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42017

<400> 174657
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174658
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42117

<400> 174658
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174659
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42128

<400> 174659
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174660
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42139

<400> 174660
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174661
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42150

<400> 174661
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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174662
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42161

<400> 174662
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174663
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42172

<400> 174663
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ugcagccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174664
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42183

<400> 174664
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174665
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42195

<400> 174665
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174666
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42310

<400> 174666
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174667
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42321

<400> 174667
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174668
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42349

<400> 174668
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174669
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42464

<400> 174669
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174670
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42497

<400> 174670
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174671
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42508

<400> 174671
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174672
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42519

<400> 174672
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174673
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42530

<400> 174673
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174674
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42577

<400> 174674
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174675
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABC42588

<400> 174675
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174676
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42599

<400> 174676
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174677
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42610

<400> 174677
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174678
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42621

<400> 174678
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174679
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42632

<400> 174679
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174680
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42643

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174681
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42654

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174682
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABC42665

<400> 174682
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174683
<211> 1410

<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42676

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174684
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABC42687

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174685
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABC42698

<400> 174685
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174686
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42709

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174687
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABC42720

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174688
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42742

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ugcuucuuca ugcagaucgc cauccugaug accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aagaaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174689
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42764

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABC42775

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174691
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42786

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174692
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<220>
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neuraminidase__InfluenzaA__ABC42797

<400> 174692
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174693
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42808

<400> 174693

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174694

<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42819

<400> 174694
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174695
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42841

<400> 174695
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cagaaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174696
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42852

<400> 174696
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174697
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42863

<400> 174697
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174698
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42874

<400> 174698
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174699
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42885

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174700
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42896

<400> 174700
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174701
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42914

<400> 174701
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174702
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42932

<400> 174702
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174703
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42943

<400> 174703

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggggcu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174704
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42954

<400> 174704
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174705
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42965

<400> 174705
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174706
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC42976

<400> 174706
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggcc augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174707
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42987

<400> 174707
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174708
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC42998

<400> 174708
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174709
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43009

<400> 174709
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174710
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC43020

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174711
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43042

<400> 174711
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gagcaucuga 1410

<210> 174712
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43053

<400> 174712
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174713
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43064

<400> 174713
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggagaaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174714
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43075

<400> 174714
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174715
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC43086

<400> 174715
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174716
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43097

<400> 174716
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174717
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43108

<400> 174717
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174718
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC43119

<400> 174718
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174719
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43130

<400> 174719
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174720
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC43141

<400> 174720
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174721
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43152

<400> 174721
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174722
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43163

<400> 174722
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174723
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43174

<400> 174723
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174724
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43185

<400> 174724
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174725
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43478

<400> 174725
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174726
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43489

<400> 174726
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174727
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43500

<400> 174727
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174728
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43511

<400> 174728
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agaccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174729
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC43522

<400> 174729
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174730
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABC43533

<400> 174730
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174731
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43544

<400> 174731
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174732
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC43555

<400> 174732
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174733
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC46557

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagac cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccguggugg acaucaacgu gaaggacuac agcaucgcca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agaagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcaacca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggagagc agaagcggcu acgagaccuu caaggugauc 1140

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174734
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC46579

<400> 174734
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccguggugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174735
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50170

<400> 174735
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174736
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABC50181

<400> 174736
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174737
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50192

<400> 174737
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174738
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50203

<400> 174738
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174739
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50214

<400> 174739
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucaucg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa ccccaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174740
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50225

<400> 174740
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174741
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50247

<400> 174741
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174742
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC50258

<400> 174742
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucaucg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcaucgagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174743
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50280

<400> 174743
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174744
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC50291

<400> 174744
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174745
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50302

<400> 174745
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ugcuuccuga ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174746
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50313

<400> 174746
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174747
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC50324

<400> 174747

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174748

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50335

<400> 174748
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174749
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50346

<400> 174749
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucaucg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174750
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50357

<400> 174750
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174751
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50368

<400> 174751
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174752
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC50379

<400> 174752
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174753
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC50390

<400> 174753
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174754
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50412

<400> 174754
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174755
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC50423

<400> 174755
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174756
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC54671

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau ccuggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174757
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC54682

<400> 174757

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174758
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC67322

<400> 174758
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174759
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67474

<400> 174759
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174760
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67546

<400> 174760
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucaucg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174761
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67557

<400> 174761
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174762
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67568

<400> 174762
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu gaaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacaacgac agaagcagca acagcuacug cagaaacccc 1020

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ggcggcugga gcacccccaa cagcaagcug cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 174763
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC67579

<400> 174763
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cccgccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174764
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC67590

<400> 174764
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174765
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67601

<400> 174765
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174766
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67612

<400> 174766
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174767
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67623

<400> 174767
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174768
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC67634

<400> 174768
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174769
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC67645

<400> 174769
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174770
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67656

<400> 174770
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174771
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67700

<400> 174771
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaacagcaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174772
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC67711

<400> 174772
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174773
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67736

<400> 174773
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174774
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC67809

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174775
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67820

<400> 174775
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174776
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67842

<400> 174776
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagac cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174777
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<212> RNA
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<400> 174777
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174778
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABC67864

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagac cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174779
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC67886

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174780
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67897

<400> 174780
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174781
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67970

<400> 174781
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174782
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67981

<400> 174782
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174783
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC67992

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ucgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174784
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC68003

<400> 174784
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174785
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC68052

<400> 174785
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174786
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABC68063

<400> 174786
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174787
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 174787
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174788
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC68085

<400> 174788
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174789
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC68096

<400> 174789
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174790
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABC68225

<400> 174790
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174791
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC68236

<400> 174791
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggaggu gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174792
<211> 1350
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC72646

<400> 174792
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agccugaugc ugcagaucgg caaccugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc agaaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cagccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacagc 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggacaag 720

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accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 174793
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC84392

<400> 174793
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 174794
<211> 1410
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC84403

<400> 174794
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcagc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174795
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC84414

<400> 174795
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174796
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 174796
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagaacug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174797
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174798
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC84447

<400> 174798
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugca ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174799
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC84501

<400> 174799
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174800
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC84512

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174801
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC84523

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174802
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC84545

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174803
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC84574

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174804
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC85757

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174805
<211> 1410
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cuggccgaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174806
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABC85779

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174807
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC85790

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174808
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC85801

<400> 174808
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174809
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABC85812

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174810
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC85823

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174811
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC85834

<400> 174811
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174812
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABC85845

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174813
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC85856

<400> 174813
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174814
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABC85867

<400> 174814
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174815
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC85900

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174816
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC85911

<400> 174816
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacaug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174817
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC85922

<400> 174817
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccac caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgacagcga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174818
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC85933

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174819
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC85955

<400> 174819
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaacagaau gcccaucuga 1410

<210> 174820
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC85966

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174821
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC85977

<400> 174821
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174822
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC85988

<400> 174822
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaagggcau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174823
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<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABC85999

<400> 174823

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174824

<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABC86010

<400> 174824
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174825
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<212> RNA
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neuraminidase__InfluenzaA__ABC86021

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 174826
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC86127

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABC86140

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

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cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174828
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABC86151

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacaagc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174829
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABC86240

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagaagauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

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<210> 174830
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gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174831
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD15452

<400> 174831
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174832
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABD15463

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174833
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 174833

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174834
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 174834
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 174835
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD15496

<400> 174835
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174836
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD15507

<400> 174836
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174837
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD15518

<400> 174837
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcggc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174838
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD15529

<400> 174838
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174839
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD15551

<400> 174839
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174840
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABD15562

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174841
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD15573

<400> 174841
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174842
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD15584

<400> 174842
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacga gaacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcauca ucguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174843
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD15595

<400> 174843
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174844
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD15606

<400> 174844
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174845
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD15617

<400> 174845
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174846
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD15639

<400> 174846
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174847
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD15650

<400> 174847
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174848
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD15661

<400> 174848
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174849
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD15683

<400> 174849
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174850
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD15694

<400> 174850
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174851
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD15705

<400> 174851
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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neuraminidase__InfluenzaA__ABD15793

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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neuraminidase__InfluenzaA__ABD16317

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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neuraminidase__InfluenzaA__ABD16328

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174861
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD16339

<400> 174861
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174862
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD16361

<400> 174862
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaag cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174863
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD16475

<400> 174863
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174864
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD16486

<400> 174864
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174865
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD16497

<400> 174865
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cuggccgaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174866
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABD16508

<400> 174866
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174867
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD16519

<400> 174867
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174868
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD16530

<400> 174868
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagaug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174869
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD16541

<400> 174869
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174870
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<220>
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neuraminidase__InfluenzaA__ABD16552

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174871
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABD16563

<400> 174871
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174872
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD16574

<400> 174872
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174873
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD16585

<400> 174873
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174874
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD16721

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucacca agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174875
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD16732

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacaagc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agaagcagca gcagcuacug cagaaacccc 1020

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ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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neuraminidase__InfluenzaA__ABD16743

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD16754

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

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aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174878

<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD16765

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gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD17326

<400> 174879
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu gaaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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uggaugggca gaaccaucag cgaggacagc agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagcug cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174880
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD38137

<400> 174880
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucaucg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggagc ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccccc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174881
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD60782

<400> 174881
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174882
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD60793

<400> 174882
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgugaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucgugag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu gaaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacaacgac agaagcagca acagcuacug cagaaacccc 1020

aacaacgaga agggcaacca cggcgugaag ggcugggccu ucgacgacgg caacgaccug 1080

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcauca ucguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174883
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD60804

<400> 174883
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggaggu gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174884
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD60815

<400> 174884
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174885
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD60826

<400> 174885
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174886
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD60837

<400> 174886
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ugcuuccuga ugcagaucgc cgugcuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174887
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD60848

<400> 174887

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ugcuuccuga ugcagguggc cauccuggug accaccguga cccugcacuu caagcaguac 120

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174888
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD60881

<400> 174888
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174889
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD60892

<400> 174889
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaguga ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174890
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD60903

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174891
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD60914

<400> 174891
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174892
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD60925

<400> 174892
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174893
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD60947

<400> 174893
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174894
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD61263

<400> 174894
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD61274

<400> 174895
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 174896
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD61285

<400> 174896
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174897
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABD61296

<400> 174897
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174898
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD61307

<400> 174898
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174899
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABD61318

<400> 174899
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174900
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD61340

<400> 174900
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174901
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD61351

<400> 174901
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174902
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD61362

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggaggu gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucgaccugau gcccaucuga 1410

<210> 174903
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD61373

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ugcuuccuga ugcagaucgc cgugcuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174904
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD61384

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174905
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD61395

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174906
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD61406

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ugcuuccuga ugcagguggc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174907
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD61521

<400> 174907
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174908
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD61532

<400> 174908
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agaagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcaacca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucgg cgaggagcug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagcug cagaucaaca gacaggugau cguggacagc 1200

gagaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucagccugau gcccaucuga 1410

<210> 174909
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD61543

<400> 174909
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcaacuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174910
<211> 1413
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD63066

<400> 174910
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174911
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77601

<400> 174911
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174912
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77612

<400> 174912
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gcugaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcaucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau caaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174913
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD77634

<400> 174913
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcaucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau caaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174914
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77645

<400> 174914
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcaucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau caaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174915
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77656

<400> 174915
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcaucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau caaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaaggccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174916
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77700

<400> 174916
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174917
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77722

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174918
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD77733

<400> 174918
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174919
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77744

<400> 174919
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ugcuuccuga ugcagaucgu gauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174920
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABD77755

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcaucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau caaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174921
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD77766

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcaucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau caaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174922
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77777

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ugcuuccuga ugcagaucgu gauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174923
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77788

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ugcuuccuga ugcagaucgu gauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174924
<211> 1362
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77799

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ggcaaccaga accacaccgg caucugcaac cagggcauca ucaccuacaa cgugguggcc 180

ggccaggaca gcaccagcgu gauccugacc ggcaacagca gccugugccc caucagaggc 240

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aucagagagc ccuucaucag cugcagccac cuggagugca gaaccuucuu ccugacccag 360

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gcccugauga gcugccccgu gggcgaggcc cccagccccu acaacagcag auucgagagc 480

guggccugga gcgccagcgc cugccacgac ggcaugggcu ggcugaccau cggcaucagc 540

ggccccgaca acggcgccgu ggccgugcug aaguacaacg gcaucaucac cgagaccauc 600

aagagcugga gaaagaagau ccugagaacc caggagagcg agugcaccug cgugaacggc 660

agcugcuuca ccaucaugac cgacggcccc agcaacggcc uggccagcua caagaucuuc 720

aagaucgaga agggcaaggu gaccaagagc aucgagcuga acgcccccaa cagccacuac 780

gaggagugca gcugcuaccc cgacaccggc aaggugaugu gcgugugcag agacaacugg 840

cacggcagca acagacccug ggugagcuuc gaccagaacc uggacuacca gaucggcuac 900

aucugcagcg gcguguucgg cgacaacccc agacccaagg acggcaccgg cagcugcggc 960

cccgugagcg ccgacggcgc caacggcgug aagggcuuca gcuacagaua cggcaacggc 1020

guguggaucg gcagaaccaa gagcgacagc agcagacacg gcuucgagau gaucugggac 1080

cccaacggcu ggaccgagac cgacagcaga uucagcguga gacaggacgu gguggccaug 1140

accgacagaa gcggcuacag cggcagcuuc gugcagcacc ccgagcugac cggccuggac 1200

ugcaugagac ccugcuucug gguggagcug aucagaggca gacccgagga ggagaccauc 1260

uggaccagcg gcagcaucau cagcuucugc ggcgugaaca gcgacaccgu ggacuggagc 1320

uggcccgacg gcgccgagcu gcccuucacc aucgacaagu ga 1362

<210> 174925
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77810

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agccugaucc ugcagaucgg caacaucgug agcaucugga ucagccacag cauccagacc 120

ggcaaccaga accacaccgg caccugcaac cagagcauca ucaccuacaa gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcguga uccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acggcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aaggagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cggcggcccc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccagcaa ggugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucga ccagaaccug gacuaccaga ugggcuacau cugcagcggc 960

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agaaccaaga gcaacagcag cagacagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg acuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 174926
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 174926
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174927
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD77876

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174928
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77887

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174929
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77898

<400> 174929
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174930
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77909

<400> 174930
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagca gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174931
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77920

<400> 174931
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174932
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<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD77931

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174933
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77942

<400> 174933
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174934
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD77953

<400> 174934
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuuccugg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174935
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD77964

<400> 174935
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

agaagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174936
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD77975

<400> 174936
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174937
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77986

<400> 174937
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174938
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD77997

<400> 174938
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acaacaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174939
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD78008

<400> 174939
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174940
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD78019

<400> 174940
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174941
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD78030

<400> 174941
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacag aaccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccaa caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174942
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABD78041

<400> 174942
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174943
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD78052

<400> 174943
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ugcuuccuga ugcagaucgu gauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174944
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD78063

<400> 174944
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174945
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD78074

<400> 174945
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174946
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD78085

<400> 174946
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174947
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD78096

<400> 174947
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174948
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD78118

<400> 174948
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau acagcggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174949
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD78129

<400> 174949
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174950
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD79035

<400> 174950
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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uggaugggca gaaccaucag cgaggacagc agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagcug cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174951
<211> 1353
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD79115

<400> 174951
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agccugaucu uccagaucgg caacaucgug agcaucugga ucagccacag caucaccggc 120

accugcaaca gaagcaucua cgugaacauc agcaacacca acguggugge cggcaaggac 180

accaccagcg ugauccuggc cggcaacagc agccugugcc ccaucagagg cugggccauc 240

uacagcaagg acaacggcgu gagaaucggc agcaagggcg acguguucgu gaucagagag 300

cccuucauca gcugcagcca ccuggagugc agaaccuucu uccugaccca gggcgcccug 360

cugaacgaca agcacagcaa cggcaccgug aaggacagaa gccccuacag aacccugaug 420

agcugccccg ugggcgaggc ccccagcccc uacaacagca gauucgagag cguggccugg 480

agcgccagcg ccugccacga cggcaugggc uggcugacca ucggcaucag cggccccgac 540

gacggcgccg uggccgugcu gaaguacaac ggcaucauca ccggcaccau caagagcugg 600

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ggcagaacca agagcagcag cagcagacag ggcuucgaga ugaucuggga ccccaacggc 1080

uggaccgaga ccgacagcaa cuucuucaug aagcaggacg ugguggccgu gaccgacugg 1140

agcggcuaca gcggcagcuu cgugcagcac cccgagcuga ccggccugga cugcaugaga 1200

cccugcuucu gggugagcu gaucagaggc agacccaagg agaacaccau cuggaccagc 1260

ggcagcagca ucagcuucug cggcgugaac agcgacaccg uggacuggag cuggcccgac 1320

ggcgccgagc ugcccuucac caucgacaag uga 1353

<210> 174952
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD79126

<400> 174952
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ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174953
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD79137

<400> 174953
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ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaag 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174954
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD79148

<400> 174954
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau caccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaag 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174955
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD79159

<400> 174955
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau caccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaag 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174956
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD79170

<400> 174956
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ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau caaggagggc 780

aagaucgugc acgugagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaag 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174957
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD79181

<400> 174957
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau caccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cuggugggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174958
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD79192

<400> 174958
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau caccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174959
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD79203

<400> 174959
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau caccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagaa gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174960
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD79214

<400> 174960
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ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

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aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174961
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD79236

<400> 174961
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ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacaa caccgcccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174962
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD79247

<400> 174962
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ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugaug 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174963
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD94737

<400> 174963
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174964
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD94748

<400> 174964
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174965
<211> 1413

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD94759

<400> 174965
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174966
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 174966
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174967
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD94792

<400> 174967
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174968
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD94803

<400> 174968
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174969
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD94814

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174970
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD94825

<400> 174970
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174971
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD94847

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaagau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174972
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD94858

<400> 174972
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174973
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD94880

<400> 174973
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174974
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD94891

<400> 174974
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau caccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaagg ugcuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174975
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD94902

<400> 174975

augaacccca accagaagau caucaccauc ggcagcguga gccugaccau caccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca caacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaag 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174976

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD94924

<400> 174976
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugccugcuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugcugggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174977
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD94946

<400> 174977
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agaagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174978
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD94957

<400> 174978
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 174979
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD94968

<400> 174979
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174980
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD94990

<400> 174980
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174981
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95001

<400> 174981
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacauccac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcaugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174982
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95012

<400> 174982
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174983
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD95023

<400> 174983
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174984
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95034

<400> 174984
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucau ccagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174985
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95056

<400> 174985

augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174986
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD95067

<400> 174986
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174987
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95078

<400> 174987
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174988
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95089

<400> 174988
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174989
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD95100

<400> 174989
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174990
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95111

<400> 174990
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174991
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95122

<400> 174991
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174992
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABD95144

<400> 174992
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174993
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95155

<400> 174993
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174994
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95166

<400> 174994
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174995
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95177

<400> 174995
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174996
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95188

<400> 174996
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174997
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD95199

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174998
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95210

<400> 174998
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 174999
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95221

<400> 174999
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175000
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95232

<400> 175000
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175001
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95243

<400> 175001
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175002
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABD95254

<400> 175002
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175003
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95265

<400> 175003
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175004
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95276

<400> 175004
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175005
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95287

<400> 175005
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175006
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95298

<400> 175006
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175007
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95309

<400> 175007
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaagu gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175008
<211> 1413
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95320

<400> 175008
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175009
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABD95331

<400> 175009
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<212> RNA
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<220>
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugccccg ugagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ucaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcggccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

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<212> RNA
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<220>
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABE11660

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<220>
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neuraminidase__InfluenzaA__ABE11671

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga acaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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<210> 175014
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABE11682

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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<212> RNA
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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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<220>
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neuraminidase__InfluenzaA__ABE11715

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ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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neuraminidase__InfluenzaA__ABE11726

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ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175019
<211> 1413

<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABE11737

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175020
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<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175021
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE11826

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175022
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABE11837

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175023
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABE11848

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175024
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABE11859

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175025
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABE11903

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

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ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175026
<211> 1413
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

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<210> 175027
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neuraminidase__InfluenzaA__ABE11952

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ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcaugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccgacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175028
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABE12035

<400> 175028
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcaugaag caggacaucg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175029
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABE12094

<400> 175029

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175030

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE12126

<400> 175030
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ugcuuccuga ugcagaucgu gauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175031
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE12263

<400> 175031
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175032
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABE12626

<400> 175032
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaagug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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uggaugggca gaaccaucag caaggacagc agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175033
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE12650

<400> 175033
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175034
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<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcagugc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABE13332

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175036
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE13558

<400> 175036
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175037
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABE13642

<400> 175037
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gagagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175038
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE13668

<400> 175038
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175039
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE13836

<400> 175039

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175040
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABE14033

<400> 175040
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccugaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175041
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE14055

<400> 175041
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucagcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcagcag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug cgugaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175042
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE14857

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaccaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175043
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE15594

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175044
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<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE26994

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175045
<211> 1350
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97641

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

uggaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175046
<211> 1350
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97642

<400> 175046
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agccugaugc ugcagaucgg caacaugauc agcaucuggc ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaacaacc ugcugaccga gaacgccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caucagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaucau cgacaaguga 1350

<210> 175047
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABE97644

<400> 175047
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175048
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97645

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gcccaccagc agcaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccauccac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accggccccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175049
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABE97646

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gagaaccagc accaggccga gagcaucagc aacaccaacc cccccaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaccc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc caugagcccc 960

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175050
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABE97647

<400> 175050
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc acagagccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc caugagcccc 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175051
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABE97649

<400> 175051
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175052
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABE97651

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

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neuraminidase__InfluenzaA__ABE97653

<400> 175053

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

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<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABE97654

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

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<212> RNA
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ggcaaccagc accaggccga gagcaccagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccauccac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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aacggcgccu acggcgugaa gggcuucgcc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accggccccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175056

<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97657

<400> 175056
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agccuggugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

gacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 900

guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc caugagcagc 960

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175057
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97658

<400> 175057
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accagaccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcagca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

gacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 900

guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc caugagcagc 960

aacggcgccc acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175058
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97659

<400> 175058
augaacccca accagaagau caucaccauc ggcagcaucu gcauggugau cggcaucgug 60

agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacga gaccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

gacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 900

guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc caugagcagc 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175059
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97660

<400> 175059
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

gacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 900

guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc caugagcagc 960

aacggcgccc acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175060
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97661

<400> 175060
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accagaccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

gacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc caugagcagc 960

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accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaccac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccgugug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175061
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97662

<400> 175061
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gaugagaaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 900

guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc caugagcccc 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175062
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97663

<400> 175062
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagcagc 960

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175063
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97665

<400> 175063
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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccacgg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175064
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97666

<400> 175064
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accagagcga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcccc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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guguucggcg acagccccag acccaacgac ggcaccggca gcugcggccc cgugagcagc 960

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175065
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97667

<400> 175065
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agccugaugc ugcagaucgg caacaugauc agcaucuggg gcagccacag cauccacacc 120

ggcaaccagc accagagcga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccguggugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175066
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97669

<400> 175066
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accagagcga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccguggugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175067
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABE97670

<400> 175067
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accagagcga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccguggugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175068
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97671

<400> 175068
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175069
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97672

<400> 175069
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggcccug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagcagc 960

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175070
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97675

<400> 175070
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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaucga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gaucgagaag 720

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agcgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175071
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97676

<400> 175071

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175072
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABE97677

<400> 175072
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ugagacacag cauccacacc 120

ggcaaccagc accagagcga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccguggugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175073
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97679

<400> 175073
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagacacag cauccacacc 120

ggcaaccagc accagagcga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccguggugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175074

<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97680

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accagagcga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

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gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175075
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABE97681

<400> 175075
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accagagcga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccguggugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagcagc 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

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accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175076
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97682

<400> 175076
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accagagcga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccguggugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagcagc 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175077
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97684

<400> 175077
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagcagc 960

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175078
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97685

<400> 175078
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 900

guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagcagc 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175079
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABE97686

<400> 175079
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagcagc 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175080
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97687

<400> 175080
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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175081
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97688

<400> 175081
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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu gugggugggc 1020

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gccgagcugc ccuucaucau cgacaaguga 1350

<210> 175082
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97690

<400> 175082
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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaag ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gaugaagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175083
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97691

<400> 175083
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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugaa gagagagccc 300

ugcaucagcu gcagccaccu gaagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175084
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97694

<400> 175084
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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gacagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

agcgugagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg cagcgugaag gacagaagcc cccacagaac ccugaugagc 420

ugcagcgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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<210> 175086
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<212> RNA
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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaacga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175087
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABE97702

<400> 175087
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ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccac cgacaaguga 1350

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ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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<400> 175089

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ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

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neuraminidase__InfluenzaA__ABE97706

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ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gagagccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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neuraminidase__InfluenzaA__ABE97707

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ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaagggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

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<211> 1350
<212> RNA
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neuraminidase__InfluenzaA__ABE97708

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ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccacgg cgcccugcug 360

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gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

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<211> 1350
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABE97710

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ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

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gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175094
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABE97711

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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cgacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175095
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<212> RNA
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<220>
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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175096
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97713

<400> 175096
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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175097
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97715

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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagcagc 960

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accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175098
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
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<400> 175098
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aaccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175099
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABE97718

<400> 175099
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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABE97719

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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gaugaagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

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<212> RNA
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neuraminidase__InfluenzaA__ABE97720

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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc accaggccga gcccaucagc aacgccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

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gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175102
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47553

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175103
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47564

<400> 175103
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175104
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABF47575

<400> 175104
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcgugg cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccacuu cgagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175105
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47586

<400> 175105

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175106
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABF47597

<400> 175106
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175107
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47608

<400> 175107
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175108
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47619

<400> 175108
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175109
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47630

<400> 175109
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcaugg cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175110
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47652

<400> 175110
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175111
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47663

<400> 175111
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175112
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47674

<400> 175112
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcauc cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175113
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47696

<400> 175113
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175114
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47707

<400> 175114
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caagggcacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175115
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47718

<400> 175115
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175116
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABF47729

<400> 175116
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175117
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABF47740

<400> 175117
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175118
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47751

<400> 175118
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175119
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47773

<400> 175119
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175120
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABF47784

<400> 175120
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175121
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47795

<400> 175121
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175122
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABF47806

<400> 175122
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175123
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47817

<400> 175123
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175124
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47839

<400> 175124
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175125
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47850

<400> 175125
augaacccca accagaagau caucaccauc ggcagcaucu gcaugaccau cggcaucauc 60

agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175126
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47872

<400> 175126
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175127
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47883

<400> 175127
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175128
<211> 1413
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABF47894

<400> 175128
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175129
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47905

<400> 175129
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175130
<211> 1362
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF47958

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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcaaccaga accacaccgg caucugcaac cagggcagca ucaccuacaa gguggugggcc 180

ggccaggaca gcaccagcgu gauccugacc ggcaacagca gccugugccc caucagaggc 240

ugggccaucc acagcaagga caacggcauc agaaucggca gcaagggcga cguguucgug 300

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ggcgcccugc ugaacgacaa gcacagcaga ggcaccuuca aggacagaag ccccuacaga 420

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guggccugga gcgccagcgc cugccacgac ggcaugggcu ggcugaccau cggcaucagc 540

ggccccgacg acggcgccgu ggccgugcug aaguacaacg gcaucaucac cgagaccauc 600

aagagcugga gaaagaacau ccugagaacc caggagagcg agugcaccug cgugaacggc 660

agcugcuuca ccaucaugac cgacggcccc agcgacggcc uggccagcua caagaucuuc 720

aagaucgaga agggcaaggu gaccaagagc aucgagcuga acgcccccaa cagccacuac 780

gaggagugca gcugcuaccc cgacaccggc aaggugaugu gcgugugcag agacaacugg 840

cacggcagca acagacccug ggugagcuuc gaccagaacc uggacuacaa gaucggcuac 900

aucugcagcg gcguguucgg cgacaacccc agacccaagg acggcaccgg cagcugcggc 960

cccgugagcg ccgacggcgc caacggcgug aagggcuuca gcuacaagua cggcaacggc 1020

guguggaucg gcagaaccaa gagcgacagc agcagacacg gcuucgagau gaucugggac 1080

cccaacggcu ggaccgagac cgacagcaga uucagcauga gacaggacgu gguggccaug 1140

accgacagaa gcggcuacag cggcagcuuc gugcagcacc ccgagcugac cggccuggac 1200

ugcaugagac ccugcuucug gguggagcug aucagaggcc ugcccgagga ggacgccauc 1260

uggaccagcg gcagcaucau cagcuucugc ggcgugaaca gcgacaccgu ggacuggagc 1320

uggcccgacg gcgccgagcu gcccuucacc aucgacaagu ga 1362

<210> 175131
<211> 1350
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABF56651

<400> 175131
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agccugaugc ugcagguggg caacaugauc agcaucuggg ugagccacag cauccacacc 120

ggcagccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

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<212> RNA
<213> Artificial Sequence

<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABF82676

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagacca ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175136
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABF82698

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caccaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

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ggcgccgaca ucaaccugau gcccaucuga 1410

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<220>

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ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

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ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABF82855

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ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175143
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABF82888

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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<212> RNA
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neuraminidase__InfluenzaA__ABF82910

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ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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<220>
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ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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neuraminidase__InfluenzaA__ABG20474

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ggcaaccaga gacaggccga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacgugc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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neuraminidase__InfluenzaA__ABG26761

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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<210> 175151
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<212> RNA
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neuraminidase__InfluenzaA__ABG26783

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuacccca acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABG26794

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<400> 175153
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABG26816

<400> 175154
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<220>
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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gagugcaaca gcccccccua caaccagauc augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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neuraminidase__InfluenzaA__ABG26893

<400> 175159
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG26915

<400> 175160
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucagcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug cgugaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175161
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG26937

<400> 175161

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gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175162

<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG26948

<400> 175162
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175163
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG26959

<400> 175163
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175164
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37123

<400> 175164
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175165
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37134

<400> 175165
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcca gcugcugggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175166
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG37145

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175167
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37156

<400> 175167
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175168
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37167

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucagcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccugaacccc 1020

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ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug cgugaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175169
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG37189

<400> 175169
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug cugcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175170
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37200

<400> 175170
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgacagcgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175171
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37211

<400> 175171

augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agaagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcaacca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175172
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG37233

<400> 175172
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggcc augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccaccauc 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca acagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgccgagagc agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175173
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37244

<400> 175173
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175174
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37255

<400> 175174
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cuggaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175175
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37266

<400> 175175
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucagcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug cgugaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175176
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37277

<400> 175176
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175177
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37288

<400> 175177
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagcuacug cuggaacccc 1020

aacaacgaga agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggagagc agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175178
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG37310

<400> 175178
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cuggaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175179
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37321

<400> 175179
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucagcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccugaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug cgugaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175180
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37332

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugca ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc ggcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cuggaacccc 1020

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ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175181
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37343

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaagaacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175182
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37354

<400> 175182
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175183
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37365

<400> 175183
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175184
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABG37387

<400> 175184
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175185
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37398

<400> 175185
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacaacacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175186
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG37409

<400> 175186
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ugcuuccuga ugcagaucgu gauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175187
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37442

<400> 175187
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguuc 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagggc 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175188
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG37453

<400> 175188
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175189
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37464

<400> 175189
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175190
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37475

<400> 175190
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcgacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175191
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37486

<400> 175191
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaacc ugaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175192
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37497

<400> 175192
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga ucaucuucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175193
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37508

<400> 175193
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175194
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37519

<400> 175194
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175195
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37530

<400> 175195
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175196
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG37541

<400> 175196
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175197
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABG37552

<400> 175197
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175198
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37563

<400> 175198
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175199
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37585

<400> 175199
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175200
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37596

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175201
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG37607

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175202
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG37618

<400> 175202
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175203
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG47810

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175204
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABG47832

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agccugaucc ugcagguggg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175205
<211> 1413

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG47843

<400> 175205
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcaugaag caggacaucg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175206
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABG47865

<400> 175206
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ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175207
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG47876

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cuggaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175208
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG47887

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cuggugggcg acacccccag aaagaacgac agcagcagca gcagcuacug cuggaacccc 1020

aacaacgaga agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175209
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG47898

<400> 175209
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucagcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug cgugaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175210
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG47909

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175211
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG47920

<400> 175211
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175212
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG47931

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175213
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG47942

<400> 175213
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175214
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG47953

<400> 175214
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 175215
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG47964

<400> 175215

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccagaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175216

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG47975

<400> 175216
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagagacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175217
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG47986

<400> 175217
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaagccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175218
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG47997

<400> 175218
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175219
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48008

<400> 175219
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aagaaacgac agcagcagca gcagcuacug cagaaagccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175220
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48019

<400> 175220
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175221
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48030

<400> 175221
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175222
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48041

<400> 175222
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175223
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48052

<400> 175223
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175224
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48063

<400> 175224
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175225
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48074

<400> 175225

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcaucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau caaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175226
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG48085

<400> 175226
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175227
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48107

<400> 175227
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagacccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175228
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48118

<400> 175228
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175229
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48129

<400> 175229
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175230
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48140

<400> 175230
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175231
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48151

<400> 175231
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175232
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG48173

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175233
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48184

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABG48195

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABG48206

<400> 175235
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucaa cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175236
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48217

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175237
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG48228

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48239

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175239
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48250

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175240
<211> 1410
<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175241
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48294

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug aucccugcc agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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cccaucgugg acaucaacgu gaaggacuac agcaucauca gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aagaaacgac agcagcagca gcagcuacug ccagaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccaaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucgaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG48305

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48316

<400> 175243
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175244
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48327

<400> 175244
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcag aggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175245
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48338

<400> 175245
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175246
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48349

<400> 175246
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggagcug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175247
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48360

<400> 175247
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

agcgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaag cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175248
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG48371

<400> 175248
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175249
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67138

<400> 175249
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccac caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175250
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67149

<400> 175250
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175251
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67160

<400> 175251
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaagcug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175252
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67171

<400> 175252
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagcuacug cuggaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175253
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABG67182

<400> 175253
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175254
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABG67193

<400> 175254
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccac caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaagaacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cuggaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175255
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67204

<400> 175255
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cuggaacccc 1020

aacaacgaga agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175256
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67215

<400> 175256
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcggccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175257
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67226

<400> 175257
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175258
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABG67248

<400> 175258
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175259
<211> 1413

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67480

<400> 175259
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175260
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG67494

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175261
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67505

<400> 175261
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagacccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175264
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67538

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccac caucgagaga 180

aacaccaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175265
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67549

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga acgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67560

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175267
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67571

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABG67582

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgccaagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG67593

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175270

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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67604

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67615

<400> 175271
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175272
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67626

<400> 175272
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175273
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67637

<400> 175273
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175274
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG67648

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175275
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67659

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcagagaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175276
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG67670

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ugcuuccuga ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175277
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG79944

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1413
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<220>
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neuraminidase__InfluenzaA__ABG79955

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175279
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG79966

<400> 175279

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175280
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggcc augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175283
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80010

<400> 175283
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggcaaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175284
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80021

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175285
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG80032

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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cugugggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccugaacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug cgugaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175286
<211> 1410
<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucagcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug cgugaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175287
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80054

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175288
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80065

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABG80076

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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cugguggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagaacug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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ugcuuccuga ugcagaucgc cgugcuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcauggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<213> Artificial Sequence

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175292
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80109

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175293
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80120

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc aucugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175294
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80131

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ugcuuccuga ugcagaucgc caucauggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175295
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80142

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175296
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175297
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80164

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gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175298
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80186

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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<210> 175299
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABG80197

<400> 175299
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175300
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABG80219

<400> 175300
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175301
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80230

<400> 175301
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcgag agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175302
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80241

<400> 175302
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175303
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80252

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175304
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80263

<400> 175304
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucaa cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175305
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80274

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagaacug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175306
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80285

<400> 175306
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175307
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80296

<400> 175307
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

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aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175308
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80307

<400> 175308
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175309
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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<400> 175309
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175310
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80329

<400> 175310
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175311
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80340

<400> 175311
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175312
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABG80351

<400> 175312
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175313
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80373

<400> 175313
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175314
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80384

<400> 175314
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175315
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80395

<400> 175315
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175316
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80406

<400> 175316
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175317
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80417

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggagcug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175318
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG80428

<400> 175318
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175319
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88292

<400> 175319
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175320
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88314

<400> 175320
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuacccca acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175321
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88325

<400> 175321
augaacccca accagaagau caucaccauc ggcagcacca gcaucgccau cggcaucauc 60

agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccagcg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ccggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgcc 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175322
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88336

<400> 175322
augaacccca accagaagau caucaccauc ggcagcaucu gcauggccau cggcaucauc 60

agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugccccg ugagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagc ugggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaaggac ggcaagggca gcugcggccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga ccaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175323
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG88347

<400> 175323

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ggccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugccccg ugagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagc ugggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaaggac ggcaagggca gcugcggccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga ccaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175324

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88358

<400> 175324
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175325
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88369

<400> 175325
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175326
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88380

<400> 175326
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175327
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88391

<400> 175327
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagcuacug cuggaacccc 1020

aacaacgaga agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggagagc agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175328
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG88402

<400> 175328
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucagcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug cgugaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175329
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG88413

<400> 175329
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaagccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggagcug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175330
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88424

<400> 175330
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175331
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88435

<400> 175331
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175332
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88446

<400> 175332
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175333
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88457

<400> 175333

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175334
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG88468

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175335
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88479

<400> 175335
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175336
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG88490

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175337
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88501

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175338
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88512

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175339
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88523

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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cugugggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175340
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG88534

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga acaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175341
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88567

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ugcuuccuga ugcagaucgc cgugcuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175342
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88600

<400> 175342
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cccgccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175343
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABG88611

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175344
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG88622

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175345
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABG88633

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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neuraminidase__InfluenzaA__ABG88655

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga acgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga acgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175351
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABG88710

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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neuraminidase__InfluenzaA__ABG88721

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABG88732

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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neuraminidase__InfluenzaA__ABG88743

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175356
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<212> RNA

<213> Artificial Sequence

<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggaggu gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABG88776

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175359
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABG88820

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagaa gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175360
<211> 1350
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABI16506

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agccugaugc ugcagaucgg caacauggug agccuguggg ugagccacag cauccagacc 120

ggcaaccagc accaggugga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc augaucaccg acaccaucaa gagcuggaga 600

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accgagaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175361
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABI20840

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

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ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175362
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI20862

<400> 175362
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175363
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI20873

<400> 175363
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agccugaccc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccaccgccu gccacgacgg caucggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc gugaucaccg agaccaucaa gagcuggaag 660

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175364
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<212> RNA
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neuraminidase__InfluenzaA__ABI20895

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucagcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug cgugaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175365
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI20906

<400> 175365
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgacagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175366
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABI20928

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175367
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI20939

<400> 175367
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175368
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABI20950

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175369
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI20961

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175370
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI20983

<400> 175370
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ugcuuccuga ugcagguggc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175371
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI20994

<400> 175371
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac aacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175372
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI21005

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21016

<400> 175373
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175374
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABI21027

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccccc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175375
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175376
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21049

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175377
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21060

<400> 175377
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cccguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175378
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<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21071

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175379
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21082

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ugcuucuuca ugcagaucgc cacccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABI21093

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagaacug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175381
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABI21104

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccuggccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175382
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABI21115

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagaacug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABI21159

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABI21170

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABI21181

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caccugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacauc 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagaa gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<220>
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neuraminidase__InfluenzaA__ABI21269

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABI21313

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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neuraminidase__InfluenzaA__ABI21324

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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neuraminidase__InfluenzaA__ABI21346

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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neuraminidase__InfluenzaA__ABI21357

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cccaucgugg acaucaacgu gaagaacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggagg ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175402
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<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175403
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABI21379

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175404
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI21390

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175405
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21401

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175406
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21412

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175407
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21423

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggaggu gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175408
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI21434

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175409
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21445

<400> 175409

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175410
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI21456

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggagcug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175411
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21467

<400> 175411
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175412
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21478

<400> 175412
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175413
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI21489

<400> 175413
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175414
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21500

<400> 175414
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175415
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21511

<400> 175415
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175416
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21533

<400> 175416
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ucaagagcau cgagcugaac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggcaga cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175417
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21544

<400> 175417
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggcaga cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175418
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21555

<400> 175418
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggcaga cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175419
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI21566

<400> 175419
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175420
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI21577

<400> 175420
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ucaagagcau cgagcugaac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggcaga cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175421
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI22112

<400> 175421
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacgag aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175422
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI22162

<400> 175422
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaccaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucgaccugau gcccaucuga 1410

<210> 175423
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI23981

<400> 175423
augaacccca accagaagau caucaccauc ggcagcaucu gcauggugau cggcaucgug 60

agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccaga gacaggccga gagcaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagaac ccugaugagc 420

agccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 900

guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagccug 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175424
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI26649

<400> 175424
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175425
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30370

<400> 175425
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuacccca acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175426
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30392

<400> 175426
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175427
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30403

<400> 175427
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175428
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30414

<400> 175428
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175429
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30425

<400> 175429
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175430
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABI30436

<400> 175430
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175431
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30447

<400> 175431

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175432
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI30458

<400> 175432
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175433
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30469

<400> 175433
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175434
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI30480

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175435
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30491

<400> 175435
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucacca agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30502

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175437
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30513

<400> 175437
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175438
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI30524

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABI30535

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175440
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABI30546

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaaccugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

agcgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggaug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagaacug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175441
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30557

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30579

<400> 175442
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175443
<211> 1410
<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagggcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30601

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABI30612

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175446
<211> 1410
<212> RNA
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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30736

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175448
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<220>
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<400> 175448
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gaguucaaca gcccccccaa caaccaggug augcuguacg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175449
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<212> RNA
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<220>
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<400> 175449
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175450
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<213> Artificial Sequence

<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175451
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30791

<400> 175451
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30802

<400> 175452
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30813

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA

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<220>
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neuraminidase__InfluenzaA__ABI30824

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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neuraminidase__InfluenzaA__ABI30835

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI30846

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175457
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<220>
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neuraminidase__InfluenzaA__ABI30857

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccacag cgagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacga gaccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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<210> 175460
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<212> RNA
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ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccacag cgagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacga gaccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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neuraminidase__InfluenzaA__ABI36179

<400> 175461
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ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccacag cgagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacga gaccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

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<400> 175462
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ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccacag cgagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacga gaccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175463
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<220>
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<400> 175463
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ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

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<212> RNA
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ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

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gccgagcugc ccuucaccau cgacaaguga 1350

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<212> RNA
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neuraminidase__InfluenzaA__ABI36298

<400> 175465
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ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

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gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

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neuraminidase__InfluenzaA__ABI36314

<400> 175466
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ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

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agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

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neuraminidase__InfluenzaA__ABI36336

<400> 175467
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cgugcagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu gagcuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175468
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<212> RNA
<213> Artificial Sequence

<220>
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<400> 175468
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cgugcagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

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accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175469
<211> 1350

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI36369

<400> 175469
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccacag cgagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacga gaccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175470
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI36391

<400> 175470
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cacccagaag 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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aucuucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cauguucccc 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175471
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI36402

<400> 175471
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cacccagaag 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175472
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI36413

<400> 175472
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccacag cgagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacga gaccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175473
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABI36446

<400> 175473
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175474
<211> 1350
<212> RNA
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<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI36457

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagaag 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175475
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
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<400> 175475
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cacccagaag 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175476
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI49409

<400> 175476
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

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<220>
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugaccagagg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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ugcuucuggg uggagcugau cagaggccag cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175478
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<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
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gcccugcuga ucggcguggg caaccuggug uucaacaccg ugauccacga gaagaucggc 120

gaccaccaga ucgugaccca ccccaccauc augacccccg aggugcccaa cugcagcgac 180

accaucauca ccuacaacaa caccgugauc aacaacauca ccaccaccau caucaccgag 240

gccgagagac ccuucaagag cccccugccc cugugccccu ucagaggcuu cuuccccuuc 300

cacaaggaca acgccaucag acugggcgag aacaaggacg ugaucgugac cagagagccc 360

uacgugagcu gcgacaacga caacugcugg agcuucgccc uggcccaggg cgcccugcug 420

ggcaccaagc acagcaacgg caccaucaag gacagaaccc ccuacagaag ccugaucaga 480

uuccccaucg gcaccgcccc cgugcugggc aacuacaagg agaucugcau cgccuggagc 540

agcagcagcu gcuucgacgg caaggagugg augcacgugu gcaugaccgg caacgacaac 600

gacgccagcg cccagaucau cuacggcggc agaaugaccg acagcaucaa gagcuggaga 660

aaggacaucc ugagaaccca ggagagcgag ugccagugca ucgacggcac cugcguggug 720

gccgugaccg acggccccgc cgccaacagc gccgaccaca gaguguacug gaucagagag 780

ggcagaauca ucaaguacga gaacgugccc aagaccaaga uccagcaccu ggaggagugc 840

agcugcuacg uggacaucga cguguacugc aucugcagag acaacuggaa gggcagcaac 900

agacccugga ugagaaucaa caacgagacc auccuggaga ccggcuacgu gugcagcaag 960

uuccacagcg acacccccag acccgccgac cccagcauca ugagcugcga cagccccagc 1020

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gacuggagcg gcuacagcgg cagcuucauc gugaaggcca aggacugcuu ccagcccugc 1260

uucuacgugg agcugaucag aggcagaccc aacaagaacg acgacgugag cuggaccagc 1320

aacagcaucg ugaccuucug cggccuggac aacgagcccg gcagcggcaa cuggcccgac 1380

ggcagcaaca ucggcuucau gcccaaguga 1410

<210> 175480
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92294

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175481
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92305

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccaccu gauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugccccg ugagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ucaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175482
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92316

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175483
<211> 1410
<212> RNA
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gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
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<220>
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neuraminidase__InfluenzaA__ABI92338

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABI92349

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccaagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABI92360

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175488
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI92382

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175489
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92393

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175490
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92404

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92415

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaacuucau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABI92426

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABI92437

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<220>
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neuraminidase__InfluenzaA__ABI92448

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABI92459

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175496
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92470

<400> 175496
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175497
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABI92481

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175498
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92492

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175499
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92503

<400> 175499
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggaggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175500
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92514

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ugcuuccugg ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagagc agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175501
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92525

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175502
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<212> RNA
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neuraminidase__InfluenzaA__ABI92536

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagaa gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcgccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92547

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcgccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABI92558

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcagaccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175505
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABI92569

<400> 175505
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaag cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175506
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABI92580

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caacaaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagggcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175507
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92591

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugaga accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagggcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175508
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92602

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gccugaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175509
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92613

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaag cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175510
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92624

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugau cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175511
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92635

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaacc ugaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175512
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92646

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABI92657

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcggccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175515
<211> 1410
<212> RNA
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<220>

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<400> 175515

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175516

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABI92701

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175517
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92712

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggcc augcugugcg agcccaccac caccgagaga 180

aacaccaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175518
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92723

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175519
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92734

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175520
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<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175521
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92756

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug auccugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175522
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABI92767

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggagaaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI92778

<400> 175523
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175524
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI92789

<400> 175524
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175525
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92800

<400> 175525

augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175526
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI92811

<400> 175526
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175527
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92822

<400> 175527
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175528
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92844

<400> 175528
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175529
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92855

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175530
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92866

<400> 175530
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ugcuuccuga uccagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucagcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175531
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92877

<400> 175531
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175532
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI92888

<400> 175532
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABI92899

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<220>
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neuraminidase__InfluenzaA__ABI92910

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175535
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175536
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92932

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92943

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175538
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI92954

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABI92965

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABI92987

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175542
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI92998

<400> 175542
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175543
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI93009

<400> 175543
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175544
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI93020

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175545
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI93031

<400> 175545
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ucaagagcau cgagcugaac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175546
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI93042

<400> 175546
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175547
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI93053

<400> 175547
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175548
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI93064

<400> 175548
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175549
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI93075

<400> 175549
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175550
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI93086

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175551
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI93097

<400> 175551
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cuggugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175552
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI93108

<400> 175552
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaacgacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175553
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI93119

<400> 175553
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac aacagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

agcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175554
<211> 1416
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI94584

<400> 175554
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aaccugcuga ucggcaucag caacgugggc cugaacguga gccugcaccu gaaggagaag 120

ggccccaagc aggaggagaa ccugaccugc accaccauca accagaacaa caccaccgug 180

guggagaaca ccuacgugaa caacaccacc aucaucacca agggcaccga ccugaagacc 240

cccagcuacc ugcugcugaa caagagccug ugcaacgugg agggcugggu ggugaucgcc 300

aaggacaacg ccgugagauu cggcgagagc gagcagauca ucgugaccag agagcccuac 360

gugagcugcg accccaccgg cugcaagaug uacgcccugc accagggcac caccaucaga 420

aacaagcaca gcaacggcac cauccacgac agaaccgccu ucagaggccu gaucagcacc 480

ccccugggca cccccccac cgugagcaac agcgacuuca ugugcguggg cuggagcagc 540

accaccugcc acgacggcau cgccagaaug accaucugca uccagggcaa caacgacaac 600

gccaccgcca ccguguacua caacagaaga cugaccacca ccaucaagac cugggccaga 660

aacauccuga gaacccagga gagcgagugc gugugccaca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cagccaggcc uacaccaagg ugauguacuu ccacaagggc 780

cugugguga aggaggagga gcugagaggc agcgccagac acaucgagga gugcagcugc 840

uacggccaca accagaaggu gaccugcgug ugcagagaca acuggcaggg cgccaacaga 900

cccaucaucg agaucgacau gagcacccug gagcacacca gcagauacgu gugcaccggc 960

auccugaccg acaccagcag acccggcgac aagagcagcg gcgacugcag caaccccauc 1020

accggcagcc ccggcgugcc cggcgugaag ggcuucggcu uccugaacgg cgacaacacc 1080

uggcugggca gaaccaucag ccccagaagc agaagcggcu ucgagaugcu gaagaucccc 1140

aacgccggca ccgaccccaa cagcagaauc gccgagagac aggagaucgu ggacaacaac 1200

aacuggagcg gcuacagcgg cagcuucauc gacuacugga acgacaacag cgagugcuac 1260

aaccccugcu ucuacgugga gcugaucaga ggcagacccg aggaggccaa guacgugugg 1320

ugggccagca acagccugau cgcccugugc ggcagccccu uccccguggg cagcggcagc 1380

uuccccgacg gcgcccagau ccaguacuuc agcuga 1416

<210> 175555
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI95220

<400> 175555
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175556
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI95242

<400> 175556
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac ggcagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcgaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175557
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI95253

<400> 175557
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agcaucaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggcaga cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175558
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABI95264

<400> 175558
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggcaga cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175559
<211> 1413

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI95275

<400> 175559
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggcaga cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175560
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABI95286

<400> 175560
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ucaagagcau cgagcugaac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggcaga cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175561
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI95297

<400> 175561
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag aacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175562
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI95308

<400> 175562
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175563
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI96131

<400> 175563
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175564
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI96133

<400> 175564
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175565
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABI96136

<400> 175565
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175566
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABJ09110

<400> 175566
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucaucc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175567
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09143

<400> 175567
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccag caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175568
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09154

<400> 175568
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175569
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABJ09165

<400> 175569

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175570

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09176

<400> 175570
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175571
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09198

<400> 175571
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175572
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09209

<400> 175572
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175573
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09220

<400> 175573
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccaagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggcagagg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175574
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09231

<400> 175574
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175575
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09242

<400> 175575
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175576
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09253

<400> 175576
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175577
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09264

<400> 175577
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua caugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagca gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg uggugcugug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175578
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABJ09286

<400> 175578
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca agcaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175579
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09308

<400> 175579

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175580
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABJ09319

<400> 175580
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175581
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09330

<400> 175581
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175582
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09341

<400> 175582
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugcugggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175583
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09352

<400> 175583
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac ggcagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175584
<211> 1407
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09374

<400> 175584
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uucuucaugc agaucgccau ccugaucacc accgugaccc ugcacuucaa gcaguacgag 120

uucaacagcc cccccaacaa ccaggugaug cugugcgagc ccaccaucau cgagagaaac 180

aucaccgaga ucguguaccu gaccaacacc accaucgaga aggagaucug ccccaagcug 240

gccgaguaca gaaacuggag caagccccag ugcgacauca ccggcuucgc ccccuucagc 300

aaggacaaca gcaucagacu gagcgccggc ggcgacaucu gggugaccag agagcccuac 360

gugagcugcg accccgacaa gugcuaccag uucgcccugg gccagggcac cacccugaac 420

aacgugcaca gcaacgacac cgugcacgac agaacccccu acagaacccu gcugaugaac 480

gagcugggcg ugcccuucca ccugggcacc aagcaggugu gcaucgccug gagcagcagc 540

agcugccacg acggcaaggc cuggcugcac gugugcguga ccggcgacga caagaacgcc 600

accgccagcu ucaucuacaa cggcagacug guggacagca ucgugagcug gagcaagaag 660

auccugagaa cccaggagag cgagugcgug ugcaucaacg gcaccugcac cguggugaug 720

accgacggca gcgccagcgg caaggccgac accaagaucc uguucaucga ggagggcaag 780

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cccagauacc ccggcgugag augcgugugc agagacaacu ggaagggcag caacagaccc 900

aucguggaca ucaacaucaa ggacuacagc aucgugagca gcuacgugug cagcggccug 960

gugggcgaca cccccagaaa gaacgacagc agcagcagca gccacugccu ggaccccaac 1020

aacgaggagg gcggccacgg cgugaagggc ugggccuucg acgacggcaa cgacgugugg 1080

augggcagaa ccaucagcga gaagcugaga agcggcuacg agaccuucaa ggugaucgag 1140

ggcuggagca accccaacag caagcugcag aucaacagac aggugaucgu ggacagaggc 1200

aacagaagcg gcuacagcgg caucuucagc guggagggca agagcugcau caacagaugc 1260

uucuacgugg agcugaucag aggcaagaag gaggagaccg aggugcugug gaccagcaac 1320

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gccgacauca accugaugcc caucuga 1407

<210> 175585
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ09385

<400> 175585
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175586
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABJ16590

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175587
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ16601

<400> 175587
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175588
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ16612

<400> 175588
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccgugg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175589
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ16623

<400> 175589
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175590
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABJ16634

<400> 175590
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac aucaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175591
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABJ16656

<400> 175591
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175592
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ16667

<400> 175592
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175593
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ16678

<400> 175593
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu ccuggugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175594
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ16689

<400> 175594
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175595
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ16700

<400> 175595
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaag aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175596
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABJ16711

<400> 175596
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175597
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ16733

<400> 175597
augaacccca accagaagau caucaccauc ggcagcauca gcguggccau cggcaucauc 60

aaccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgaca ucuucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175598
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABJ16744

<400> 175598
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175599
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABJ16755

<400> 175599
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175600
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ16766

<400> 175600
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175601
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ16777

<400> 175601
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175602
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ16788

<400> 175602
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175603
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ53441

<400> 175603
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175604
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ53452

<400> 175604
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

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<210> 175605
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ53463

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175606
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ53474

<400> 175606
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175608
<211> 1413
<212> RNA
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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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<210> 175609
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175610
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABJ53518

<400> 175610
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aaccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caaccugagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175611
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABK39965

<400> 175611
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175612
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABK39976

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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<212> RNA
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABK40020

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ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

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<210> 175617
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<212> RNA
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<400> 175617
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aaccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175618
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK40053

<400> 175618
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aaccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175619
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK40064

<400> 175619
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175620
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK40078

<400> 175620
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175621
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABK40513

<400> 175621
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

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<210> 175622
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<212> RNA
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neuraminidase__InfluenzaA__ABK40538

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

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<210> 175623
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<400> 175623

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

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<210> 175624

<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABK40560

<400> 175624
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

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neuraminidase__InfluenzaA__ABK40571

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175626
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK40582

<400> 175626
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175627
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK40593

<400> 175627
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagccaca gaaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuacaaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175628
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK40604

<400> 175628
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175629
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK40615

<400> 175629
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175630
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK40626

<400> 175630
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175631
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK40648

<400> 175631
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175632
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK40659

<400> 175632
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175633
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABK40681

<400> 175633

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175634
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABK40692

<400> 175634
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcugggag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcgu ggagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175635
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABK40703

<400> 175635
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175636
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK40714

<400> 175636
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175637
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK40725

<400> 175637
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175638
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK40736

<400> 175638
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175639
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABK40747

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaag cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175640
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABK79951

<400> 175640
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175641
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK79973

<400> 175641
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aaccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175642
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK79984

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175643
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABK79995

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

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<210> 175645
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABK80039

<400> 175645
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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<210> 175646
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABK80050

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175647
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK80061

<400> 175647
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175648
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABK80072

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175649
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK80083

<400> 175649
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175650
<211> 1410
<212> RNA
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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175651
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<212> RNA
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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

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<220>
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neuraminidase__InfluenzaA__ABK80138

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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neuraminidase__InfluenzaA__ABK80149

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gagugcaaca gcccccccaa caaccaggcc augcuguacg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gagugcaaca gcccccccaa caaccaggcc augcuguacg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA

<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABK80204

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaag cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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neuraminidase__InfluenzaA__ABK80237

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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neuraminidase__InfluenzaA__ABK80259

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucaucc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175663
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABK80270

<400> 175663
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175664
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK80281

<400> 175664
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175665
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK80292

<400> 175665
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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agcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175666
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABK80303

<400> 175666
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcuguacg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcaacgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175667
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABK80314

<400> 175667
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gcccccccaa caaccaggug augcuguacg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175668
<211> 1350
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABL07021

<400> 175668
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagaag 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcauca cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gaugaagaag 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175669
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABL07032

<400> 175669
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agccugaugc ugcagaucgg caacauggug agcaccuggg ugagccacag cauccagacc 120

ggcaaccagu accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175670
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABL31746

<400> 175670
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ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

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gccagcgccu gccacgacgg caacagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aagaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175671
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABL31757

<400> 175671
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

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<220>
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neuraminidase__InfluenzaA__ABL31768

<400> 175672
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175673
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABL67168

<400> 175673
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175674
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABL67179

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175675
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABL67190

<400> 175675
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aaccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcaugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175676
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABL67201

<400> 175676
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175677
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABL67212

<400> 175677
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aaccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

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<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABL67256

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175679
<211> 1413
<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABL67267

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

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<210> 175680

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABL67278

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175681
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABL67289

<400> 175681
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gagugcaaca gcccccccaa caaccaggug augcuguacg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175683
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABL67311

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175684
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABL67322

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175685
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABL67333

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ugcuuccuga ugcagaucgc cauccuggug aucaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaag cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABL67344

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABL67355

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175689
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABL67377

<400> 175689

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<211> 1410
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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaaccagc acaaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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ggcaaccagc acaaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacagc 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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ggcaaccagc acaaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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ggcaaccagc acaaggccga gcccaucagc aacaccaacc ugcugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucgacggcug ggccguguac 240

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aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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gccagcguga agcuggccgg caacagcagc cugugcccca ucgacggcug ggccguguac 240

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gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22018

<400> 175700
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175701
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22029

<400> 175701
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aaccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcaugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175702
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22040

<400> 175702
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175703
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABM22062

<400> 175703

augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcuguacg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175704

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22073

<400> 175704
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu caaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaag cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175705
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22084

<400> 175705
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175706
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22095

<400> 175706
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggcc augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugca ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175707
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22106

<400> 175707
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175708
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABM22117

<400> 175708
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175709
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22128

<400> 175709
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ugcuuccuga uccagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucagcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175710
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABM22139

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175711
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22150

<400> 175711
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccgag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175712
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22161

<400> 175712
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175713
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22172

<400> 175713

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175714
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABM22183

<400> 175714
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175715
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22194

<400> 175715
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175716
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22205

<400> 175716
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175717
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABM22216

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175718
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22227

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175719
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22238

<400> 175719
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175720
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22271

<400> 175720
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcugggc gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175721
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22282

<400> 175721
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175722
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22304

<400> 175722
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175723
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22315

<400> 175723
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175724
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22326

<400> 175724
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175725
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABM22337

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175726
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22348

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

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aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175727
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM22359

<400> 175727
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175728
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABM22370

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcau cagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175729
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM66867

<400> 175729
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175730
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABM66900

<400> 175730
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175731
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM66911

<400> 175731
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175732
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM66922

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABM66933

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175734
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM66944

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABM66955

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175736
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM66966

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175737
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM66977

<400> 175737
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

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aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcau cagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175738
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<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175740
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABM67010

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175741
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABM67021

<400> 175741
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175742
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABM67054

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175743
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<212> RNA
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ggcaaccagu gccaggccgg ccccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagagc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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gccgagcugc ccuucaccau cgacaaguga 1350

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ggcaaccagu gccaggccga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABM90436

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ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gaugaagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175746
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM90447

<400> 175746
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagaag 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gaugaagaag 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175747
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<400> 175747

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagaag 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gaugaagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175748
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABM90469

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagaag 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gaugaagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175749
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABM90491

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ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gaugaagaag 720

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accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175750

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABM90502

<400> 175750
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagaag 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gaugaagaag 720

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc caugagcccc 960

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agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175751
<211> 1350
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABM90524

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gugagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175752
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABM90535

<400> 175752
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gugagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

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<220>
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neuraminidase__InfluenzaA__ABM90546

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gagcaucagc aacaccaacc cccugaccga gaaggccgug 180

gugagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccgugcac 240

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

gaggccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 175754
<211> 1413
<212> RNA
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<220>
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggccag gccagcuaca gaaucuucaa gaucgagaag 780

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<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN50770

<400> 175755
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABN50903

<400> 175756
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugccccg ugagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcggccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucau ccagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175757
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN50920

<400> 175757
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175758
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN50931

<400> 175758
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agccugaucc ugcagaucgg caacaucgug agcaucugga ucagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg ccaggacacc 240

accagcgugg cccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccaa caacggcccc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acgccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcggccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaagaggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175759
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN50943

<400> 175759
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agccugaucc ugcagaucgg caacaucgug agcaucugga ucagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg ccaggacacc 240

accagcgugg cccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccaa caacggcccc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acgccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcggccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaagaggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaaguu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac ggcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175760
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN50954

<400> 175760
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175761
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN50965

<400> 175761
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175762
<211> 1413
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN50976

<400> 175762
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175763
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN50987

<400> 175763
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175764
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN50998

<400> 175764
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175765
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN51013

<400> 175765
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175766
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN51024

<400> 175766
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175767
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN51035

<400> 175767
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175768
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN51046

<400> 175768
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175769
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABN51069

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagaugg ugugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175770
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN51080

<400> 175770
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175771
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175772
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABN51102

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 175774
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN51124

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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 175775
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABN51135

<400> 175775
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 175776
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN51146

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175777
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN51157

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175778
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN59393

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175779
<211> 1365
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN59415

<400> 175779
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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagaacauca ucaccuacaa gaacagcacc 180

ugggugaagg acaccaccag cgugauccug accggcaaca gcagccugug ccccaucaga 240

ggcugggcca ucuacagcaa ggacaacagc aucagaaucg gcagcaaggg cgacguguuc 300

gugaucagag agcccuucau cagcugcagc caccuggagu gcagaaccuu cuuccugacc 360

cagggcgccc ugcugaacga caagcacagc agcggcaccg ugaaggacag aagccccuac 420

agagcccuga ugagcugccc cgugggcgag gcccccagcc ccuacaacag cagauucgag 480

agcguggccu ggagcgccag cgccugccac gacggcaugg gcuggcugac caucggcauc 540

agcggccccg acaacggcgc cguggccgug cugaaguaca acggcaucau caccgagacc 600

aucaagagcu ggagaaagaa gauccugaga acccaggaga gcgagugcgc cugcgugaac 660

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gaccccaacg gcuggaccga gaccgacagc aaguucagcg ugagacagga cgugguggcc 1140

augaccgacu ggagcggcua cagcggcagc uucgugcagc accccgagcu gaccggccug 1200

gacugcauga gacccugcuu cugggugggag cugaucagag gcagacccaa ggagaagacc 1260

aucuggacca gcgccagcag caucagcuuc ugcggcguga acagcgacac cguggacugg 1320

agcuggcccg acggcgccga gcugcccuuc agcaucgaca aguga 1365

<210> 175780
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABN59426

<400> 175780
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175781
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO32659

<400> 175781
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175782
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO32670

<400> 175782
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ugcuucuuca ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175783
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO32681

<400> 175783
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcugggag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175784
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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<400> 175784
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175785
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO32754

<400> 175785
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175786
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO32765

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO32778

<400> 175787
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ugcuuccuga uccagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucagcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cuggugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175788
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO32793

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ugcuucuuca ugcagaucgu gauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaagacc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175789
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO32806

<400> 175789
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO32819

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175791
<211> 1410
<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175792
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO32841

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175793
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO32852

<400> 175793
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175794
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABO32863

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175795
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABO32874

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175796
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABO32918

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagac cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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<212> RNA
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neuraminidase__InfluenzaA__ABO32929

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagac cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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<220>
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neuraminidase__InfluenzaA__ABO32940

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagac cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<211> 1413
<212> RNA
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ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175803
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagcaaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccaacgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucaagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175804
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175805
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABO32984

<400> 175805

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175806

<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

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<210> 175807
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABO33009

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175808
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ABO33039

<400> 175808
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABO33050

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175810
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175811
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABO33072

<400> 175811
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gagugcggca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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aacaacgaga agggcaacca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgaggagagc agaagcggcu acgagaccuu caaggugauc 1140

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175812
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<220>
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neuraminidase__InfluenzaA__ABO37991

<400> 175812
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175813
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<220>
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neuraminidase__InfluenzaA__ABO38013

<400> 175813
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uacgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175814
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacaacacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaaca ucguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagaugg ugugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175815
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38035

<400> 175815

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caccugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagguga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggcaug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175816
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABO38046

<400> 175816
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175817
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38068

<400> 175817
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175818
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38079

<400> 175818
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175819
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38090

<400> 175819
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175820
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABO38101

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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175821
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABO38233

<400> 175821
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu gaaggacuac agcaucgcca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agauacagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcaacca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgacgagagc agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagcug cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175822
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38244

<400> 175822
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccauc 60

ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agaagcagca gcagcuacug cagaaacccc 1020

aacaacgaga agggcaacca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucgg cgaggagcug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagcug cagaucaaca gacaggugau cguggacagc 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175823
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38255

<400> 175823
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175824
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38277

<400> 175824
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175825
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38288

<400> 175825
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagac cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaacagcaa cagcaagcug cagaccaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175826
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38299

<400> 175826
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccaccgug 60

ugcuucauca ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gccguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccgacgu gagaugcacc ugcagagaca acuggaaggg cagcaacaga 900

cccgugaucg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaacgacgac agcagcagca acagcaacug cagagacccc 1020

aacaacgaga gaggcaaccc cggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

uggaugggca gaaccaucaa caaggacagc agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagagc caggugaaca gacaggugau cguggacaac 1200

aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga ccccaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 175827
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABO38310

<400> 175827
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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccaccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

uaccccagau accccgacgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccgugaucg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacggcgac agcagcagca acagcaacug cagagacccc 1020

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ugcuucuacg uggagcugau cagaggcaga ccccaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 175828
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38332

<400> 175828
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaugauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175829
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38343

<400> 175829
augaacccca accagaagau caucaccauc ggcagcaucu gcaugaccau cggcaucauc 60

agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcuggu gagaggcaga cccagagagg gcaccaccgu guggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175830
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38354

<400> 175830
augaacccca accagaagau caucaccauc ggcagcaucu gcaugguggu gggcaucauc 60

agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagaacauca ucaccuacaa gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg ccaggacacc 240

accagcguga uccugaccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacagac acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagaagaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagguga ccaagagcau cgagcugaac gcccccaaca gccacuacga ggagugcagc 840

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agaaccaaga gcaacagcag cagacacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg acuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 175831
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38365

<400> 175831
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agccugaucc ugcagauggg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175832
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 175832
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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcagccaga accacaccgg caccugcaac cagagcauca ucaccuacaa gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcguga uccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acggcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aaggagaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cggcggcccc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca acugcggccc cguguacgug 1020

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agaaccaaga gcaacagcag cagacagggc uucgagauga ucugggaccc caacggcugg 1140

accgagaccg acagcaacuu cuucgugaag caggacgugg uggccgugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga agaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg acuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 175833
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38387

<400> 175833
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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagcauca ucaccuacaa gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg ccaggacacc 240

accagcguga uccugaccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acggcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

gaggccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagaagaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggccug gccagcuaca agaucuucaa gaucgagaag 780

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ugcuaccccg acaccggcaa ggugaugugc gugugcagag acaacuggca cggcagcaac 900

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guguucggcg acaaccccag acccaaggac ggcaccggca gcugcggccc cguguacgug 1020

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agaaccaaga gcaccagcag cagacacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg acuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 175834
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABO38398

<400> 175834
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agccugaucc ugcagaucgg caacaucgug agcaucugga ucagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg ccaggacacc 240

accagcgugg cccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga aacuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccaa caacggcccc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acgccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaagaggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac ggcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175835
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABO38420

<400> 175835
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175836
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO38715

<400> 175836
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

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gugguggagu acagaagcug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 175837
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABO38726

<400> 175837
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagac cugccccaag 240

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175838
<211> 1413
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO44049

<400> 175838
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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<210> 175839
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO44060

<400> 175839
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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

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cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 175840
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABO44071

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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 175841
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABO44082

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug cgccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175842
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO44093

<400> 175842
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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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cugugggcg acacccccag aaacgacgac agcagcagca acagcaacug cagagacccc 1020

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175843
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO44104

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 175844
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO44126

<400> 175844
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agccugaucc ugcagaucgg caacaucgug agcaucugga ucagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg ccaggacacc 240

accagcgugg cccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccaa caacggcccc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcugaac gcccccaaca gccacuacga ggagugcagc 840

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ggcagcagca ucagcuucug cggcgugaac ggcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175845
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO52228

<400> 175845
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

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<210> 175846
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO52239

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ugcuucauca ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

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gccguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

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<210> 175847
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO52250

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 175848
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABO52261

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc cgacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175849
<211> 1413

<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABO52283

<400> 175849
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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga uccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaucaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaug uga 1413

<210> 175850
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 175850
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca agcaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175851
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO52316

<400> 175851
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccagauc augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac aucaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccag cagaugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agaagcagca acagcuacug cagaaacccc 1020

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uggaugggca gaaccaucag cgaggacagc agaagcggcu acgagaccuu caaggugauc 1140

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcgccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO52327

<400> 175852
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu cagacaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaacaacgac agaagcagca acagcaacug cagaaacccc 1020

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175853
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABO52338

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccguggugg acaucaacgu gaaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABO52349

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacgugaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABO52360

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABO52371

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gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

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cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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neuraminidase__InfluenzaA__ABO52800

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

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ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

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neuraminidase__InfluenzaA__ABP49220

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175859
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABP49319

<400> 175859

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga uccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcaa ggugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175860

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABP49330

<400> 175860
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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagcauca ucaccuacaa gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caagggcacc 240

acccccguga uccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acggcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccugcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

gaggccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagaagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucga ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 175861
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABP49352

<400> 175861
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcgugg cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga gaaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175862
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABP49363

<400> 175862
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agccugaucc ugcagaucgg caacaucgug agcaucugga ucagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg ccaggacacc 240

accagcgugg cccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccaa caacggcccc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acgccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcggccc cgugaccgug 1020

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agaaccaaga gcaacagcag cagaagaggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175863
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABP49374

<400> 175863
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175864
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABP49385

<400> 175864
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aaccugaccc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175865
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABP49396

<400> 175865
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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<210> 175866
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABP49407

<400> 175866
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagaucug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175867
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABP49418

<400> 175867
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175868
<211> 1410
<212> RNA
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<220>
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<400> 175868
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175869
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 175869

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ugcuuccuga uccagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

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aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 175870
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABP49451

<400> 175870
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175871
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABP49462

<400> 175871
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ugcuucauca ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gccguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 175872
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABP49473

<400> 175872
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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

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aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga ccccaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 175873
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<220>
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<400> 175873
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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<210> 175874
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABP49506

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

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gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 175875
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABP49517

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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175876
<211> 1413
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<220>
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neuraminidase__InfluenzaA__ABQ01314

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga uccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaucaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acggcaacuu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175877
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABQ01325

<400> 175877
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggccag gccagcuaca gaaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175878
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABQ01336

<400> 175878
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175879
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175880
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABQ01358

<400> 175880
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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcaaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cuggaggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcaacgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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cugguggggcg acacccccag aaacgacgac agcagcagca acagcaacug cagagacccc 1020

aacaacgaga gaggcaaccc cggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

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ugcuucuacg uggagcugau cagaggcaga agccaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 175881
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABQ01369

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ugcuucguga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175882
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABQ44386

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga acgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ABQ44408

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABQ44419

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ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg ccaggacacc 240

accagcgugg cccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccaa caacggcccc gccagcuaca agaucuucaa gaucgagaag 780

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gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaagaggc uucgagauga ucugggaccc caacggcugg 1140

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<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABQ44430

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
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<220>
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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

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gugguggagu acagaagcug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

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ggcgccaaca ucaacuucau gcccaucuga 1410

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<212> RNA
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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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<212> RNA
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga uccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaucaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcaa ggugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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neuraminidase__InfluenzaA__ABR15811

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga uccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaucaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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neuraminidase__InfluenzaA__ABR15954

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175896
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<212> RNA
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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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neuraminidase__InfluenzaA__ABR28518

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175898
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<212> RNA
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<220>
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gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcua cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175899
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABR28771

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABR28782

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175901
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<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175902
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABR28804

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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<211> 1410

<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABR28815

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175904
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175905
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<212> RNA
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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175906
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABR28848

<400> 175906
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucguggg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagaugg ugugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175907
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABR28859

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac ggcagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175908
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABR28870

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaccgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175909
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABR28881

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175910
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABR28892

<400> 175910
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175911
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABR28903

<400> 175911
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175912
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABR28925

<400> 175912
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175913
<211> 1410
<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABR88082

<400> 175913

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aacaucaccg agaucgugua ccugaccaac accaucaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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cccaucgugg acaucaacau caagaacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175914

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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS00324

<400> 175914
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agccugaucc ugcagaucgg caacaucgug agcaucugga ucagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg ccaggacacc 240

accagcgugg cccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccaa caacggcccc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acgccggcac cgugaugugc gugugcagag acaacuggag aggcagcaac 900

agacccuggg ugagcuucaa ccagagccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaagaggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaaguu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac ggcgacaccg ccaacuggag cuggcccgac 1380

ggcagcgagc ugcccuucac caucgacaag uga 1413

<210> 175915
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS49902

<400> 175915
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu cagacaguac 120

gagugcgaca gccccgccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacaacgac agaagcagca acagcaacug cagaaacccc 1020

aacaacgaga gaggcaacca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag caaggaccug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga gagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175916
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS49913

<400> 175916
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu cagacaguac 120

gagugcgaca gccccaccaa caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacgu ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacaacgac agaagcagca acagcaacug cagaaacccc 1020

aacaacgaga gaggcaacca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175917
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS49968

<400> 175917
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175918
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS49979

<400> 175918
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175919
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS49990

<400> 175919
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga uccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175920
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABS50001

<400> 175920
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175921
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS50012

<400> 175921
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175922
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS50023

<400> 175922
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ugcuuccuga ugcagaucgc cgugcuggug accaccguga cccugcacuu caagcaguac 120

gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175923
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS50034

<400> 175923

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175924
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABS50045

<400> 175924
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ugcuuccuga ugcagaccgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccauccac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175925
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS50056

<400> 175925
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175926
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS50067

<400> 175926
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175927
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS50078

<400> 175927
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175928
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS71644

<400> 175928
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

gagagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagaccau ggagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcggcaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175929
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS71646

<400> 175929
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

gagagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagaccau ggagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaugggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcggcaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175930
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABS71647

<400> 175930
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

gagagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagaccau ggagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaugggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcggcgccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175931
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS71648

<400> 175931
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcaaccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagaccau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcggcaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175932
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS71649

<400> 175932
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175933
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS71651

<400> 175933
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacaacacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagcg ugagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccagcu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggcugggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcaacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175934
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS71652

<400> 175934
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacaacacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagcg ugagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccagcu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcaacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175935
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS71653

<400> 175935
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugauc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcag agagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaucggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgcc 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175936
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS71655

<400> 175936
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175937
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS71657

<400> 175937
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagauacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175938
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABS71659

<400> 175938
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagauacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccacau gcccaucuga 1410

<210> 175939
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS71660

<400> 175939
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175940
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABS71661

<400> 175940
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175941
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABS71662

<400> 175941
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175942
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABS71663

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgaccagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175943
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABU40956

<400> 175943
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caacugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucaucg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU50651

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU80180

<400> 175945
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcuuccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175946
<211> 1413
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU80301

<400> 175946
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175947
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU80312

<400> 175947
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 175948
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABU80323

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175949
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABU80334

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aagacccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175950
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92762

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175951
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABU92764

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau cauggagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaacg ugaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaag aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175952
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92765

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175954
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92768

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175956
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABU92769

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175957
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92770

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175958
<211> 1410
<212> RNA
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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 175959
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABU92772

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaccgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaagcccaa cagcaagcug cagaccaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175961
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92774

<400> 175961
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaccgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175962
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92775

<400> 175962
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175963
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92777

<400> 175963
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175964
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92778

<400> 175964
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggaggu gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175965
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92779

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175966
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92780

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175967
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92781

<400> 175967

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175968

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92782

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175969
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92783

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175970
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABU92784

<400> 175970
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175971
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92785

<400> 175971
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175972
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92786

<400> 175972
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175973
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92787

<400> 175973
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175974
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92789

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcagca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175975
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92790

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175976
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175977
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92792

<400> 175977

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

guguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175978
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92793

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175979
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABU92794

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augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcagca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175980
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92795

<400> 175980
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175981
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92796

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175982
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92797

<400> 175982
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

agaauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175983
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92798

<400> 175983
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175984
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92799

<400> 175984
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175985
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92800

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175986
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92801

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugca ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175987
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92802

<400> 175987
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175988
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92804

<400> 175988
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175989
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175990
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<212> RNA
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neuraminidase__InfluenzaA__ABU92806

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175991
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucac cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucaucc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABU92809

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgacgugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 175993
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92810

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau gaucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc gugggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABU92814

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92815

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABU92816

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176000
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<212> RNA

<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

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cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

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ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABU92828

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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<212> RNA
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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neuraminidase__InfluenzaA__ABU92831

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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neuraminidase__InfluenzaA__ABU92832

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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neuraminidase__InfluenzaA__ABU92834

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<220>
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neuraminidase__InfluenzaA__ABU92836

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176017
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABU92837

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucgcca gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug cgugaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176018
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABU92838

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176019
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92839

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176020
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92840

<400> 176020
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176021
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92841

<400> 176021

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176022

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92842

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gacugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABU92843

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176024
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABU92844

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176025
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABU92845

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176026
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92846

<400> 176026
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176027
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92847

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176028
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92848

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176029
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92849

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176030
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92850

<400> 176030
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

accgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga acgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176031
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92851

<400> 176031

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcagca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa gaaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua caugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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neuraminidase__InfluenzaA__ABU92854

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92855

<400> 176035
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau caucgagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176036
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92856

<400> 176036
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176037
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92857

<400> 176037
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176038
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92858

<400> 176038
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug auccugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176039
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92859

<400> 176039
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccgccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccggcu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176040
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92860

<400> 176040
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccgccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cugguacaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucauca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176041
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92861

<400> 176041
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccgccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcauggc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176042
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92862

<400> 176042
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccgccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcagagaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176043
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92863

<400> 176043
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cgccgccauc 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176044
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92865

<400> 176044
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccugga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176045
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92866

<400> 176045
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggaggu gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca acagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176046
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176046
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaccgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176047
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92868

<400> 176047
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcagca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176048
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92869

<400> 176048
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176049
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92870

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176050
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92872

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac aacaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176051
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92873

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaacaucau gcccaucuga 1410

<210> 176052
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92874

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176053
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92875

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABU92877

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176056
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92879

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagggcgaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176058
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92880

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac aacaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176059
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABU92881

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABU92882

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176061
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92883

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa gaaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176062
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<220>
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neuraminidase__InfluenzaA__ABU92884

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176063
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92885

<400> 176063
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176064
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABU92886

<400> 176064
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176065
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92887

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaagcccaa cagcaagcug cagaucaaca gacaggugau cguggagaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176066
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92888

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucauca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176067
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92889

<400> 176067
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176068
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92890

<400> 176068
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcuggu gagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176069
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92891

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccaa caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176070
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92892

<400> 176070
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcaaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176071
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92893

<400> 176071
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

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gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176072
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92895

<400> 176072
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176073
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92896

<400> 176073
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcaa cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176074
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABU92897

<400> 176074
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gagcugaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176075
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92898

<400> 176075

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caagaacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaccgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa ccggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176076

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92899

<400> 176076
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176077
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92900

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176078
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92901

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucagcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176079
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92902

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176080
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92903

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176081
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92904

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176082
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92905

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176083
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176083
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaagcugau gcccaucuga 1410

<210> 176084
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92907

<400> 176084
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176085
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92908

<400> 176085

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcuucagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176086
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABU92909

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176087
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABU92910

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ugcuuccuga cccagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABU92911

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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

caggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABU92913

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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176090
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29560

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176091
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29571

<400> 176091
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176092
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29582

<400> 176092
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176093
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29615

<400> 176093
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176094
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29637

<400> 176094
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcacc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucag cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176095
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29648

<400> 176095
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176096
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABV29659

<400> 176096
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176097
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABV29670

<400> 176097
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176098
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29681

<400> 176098
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcaucgac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176099
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29692

<400> 176099
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176100
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29703

<400> 176100
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176101
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29714

<400> 176101
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcgaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176102
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABV29725

<400> 176102
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccagggc augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uuccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176103
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29736

<400> 176103
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg uggugaccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176104
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29747

<400> 176104
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176105
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29769

<400> 176105
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176106
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABV29780

<400> 176106
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg uggugaccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcagcaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176107
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABV29791

<400> 176107
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176108
<211> 1413
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABV29802

<400> 176108
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176109
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29824

<400> 176109
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176110
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29835

<400> 176110
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176111
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29846

<400> 176111
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagauc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176112
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29879

<400> 176112
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucaucau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176113
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29890

<400> 176113
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176114
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29901

<400> 176114
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176115
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABV29912

<400> 176115
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc aucugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176116
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29923

<400> 176116
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176117
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV29934

<400> 176117
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa ccggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176118
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABV29945

<400> 176118
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg uggugaccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acaacgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176119
<211> 1413

<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABV29956

<400> 176119
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaagggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176120
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABV29989

<400> 176120
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176121
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30000

<400> 176121
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176122
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30011

<400> 176122
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176123
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30022

<400> 176123
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176124
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30044

<400> 176124
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcggca cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176125
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABV30055

<400> 176125
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176126
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABV30077

<400> 176126
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176127
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABV30088

<400> 176127
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176128
<211> 1413
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30099

<400> 176128
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176129
<211> 1413
<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABV30110

<400> 176129

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176130

<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABV30132

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176131
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30143

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABV30154

<400> 176132
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABV30165

<400> 176133
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caaccugagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABV30187

<400> 176134
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABV30198

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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<210> 176136
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30209

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176137
<211> 1410
<212> RNA
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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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<400> 176138
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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<400> 176139

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agguggugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176140
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABV30275

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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcacccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176141
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30297

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30308

<400> 176142
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcc ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176143
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30319

<400> 176143
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agccugaugc ugcagaucgg caacaucgug agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

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<220>
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neuraminidase__InfluenzaA__ABV30330

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<220>
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neuraminidase__InfluenzaA__ABV30341

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176146
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABV30363

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176147
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<220>
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neuraminidase__InfluenzaA__ABV30374

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176148
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30385

<400> 176148
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucagcc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagauacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176149
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30396

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugagcgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga acgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176150
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30407

<400> 176150
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcggccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176151
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABV30418

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucagca gccugcccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga agagaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176152
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30429

<400> 176152
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa ccggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30440

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa ccggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176154
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABV30451

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcaacagaa ccggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176155
<211> 1413
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30462

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176156
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABV30473

<400> 176156
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa ccggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176157
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30484

<400> 176157
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagauacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca acagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176158
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30495

<400> 176158
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176159
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30506

<400> 176159
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176160
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30517

<400> 176160
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176161
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30528

<400> 176161
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agccugaugc ugcagaucgg caacaucauc agcauguggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176162
<211> 1413
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30539

<400> 176162
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176163
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30561

<400> 176163
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176164
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30572

<400> 176164
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176165
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30583

<400> 176165
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176166
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30594

<400> 176166
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176167
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30605

<400> 176167
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggugg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176168
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30616

<400> 176168
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176169
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30627

<400> 176169
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176170
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30649

<400> 176170
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaacgcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176171
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV30660

<400> 176171
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176172
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABV45852

<400> 176172
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccaa caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176173
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV45863

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176174
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV45874

<400> 176174
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagcuacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176175
<211> 1413
<212> RNA
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<220>
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<400> 176175
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176176
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABV45896

<400> 176176
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg uggugaccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176177
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV45918

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176178
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV45929

<400> 176178
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agccugaugc ugcagaucgg caacaucauc agcauguggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg uggugaccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176179
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABV45940

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucagauacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagagccug gacuaccagg ugggcuacau cugcagcggc 960

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176180
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABV45951

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176181
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABV45973

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgacgugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176182
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV45984

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<220>

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV82554

<400> 176184
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg uggugaccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acaacgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176185
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABV82565

<400> 176185
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176186
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABW36171

<400> 176186
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176187
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW36193

<400> 176187
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcc ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176188
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW36204

<400> 176188
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176189
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW36215

<400> 176189
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caagggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaac 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcagaggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagccacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucaagccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucau caucgacaag uga 1413

<210> 176190
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW36226

<400> 176190
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176191
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW36237

<400> 176191
augaacccca accagaagau caucaccauc ggcagcauca gcaucaccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176192
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW36248

<400> 176192
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176193
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW36259

<400> 176193

augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

gugcugggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugagc agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176194
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABW36281

<400> 176194
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176195
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW36292

<400> 176195
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176196
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW36303

<400> 176196
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg uggugaccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176197
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW36314

<400> 176197
augaacccca accagaagau caucaccauc ggcagcaucu gcauggccau cggcaucauc 60

agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggccag gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176198
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW38366

<400> 176198
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgccag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176199
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW39780

<400> 176199
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caagggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaac 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcagaggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagccacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucaagccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucau caucgacaag uga 1413

<210> 176200
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW39809

<400> 176200
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

acccugguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176201
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW39820

<400> 176201
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg uggugaccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176202
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW39831

<400> 176202
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

acccccguga cccugguggg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaag accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau ggagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagaau cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac ggcgacaucg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176203
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW39842

<400> 176203
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176204
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABW39864

<400> 176204
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176205
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW39875

<400> 176205
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176206
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW39886

<400> 176206
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

agaaaccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176207
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW39897

<400> 176207
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176208
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW39908

<400> 176208
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176209
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW39930

<400> 176209
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176210
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABW39952

<400> 176210
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176211
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW39963

<400> 176211
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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<210> 176213
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<212> RNA
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<400> 176213
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcacc gccagcuaca agaucuucaa gaucgagaag 780

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<210> 176214
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW40007

<400> 176214
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

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<210> 176215
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW40018

<400> 176215
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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<210> 176216
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<213> Artificial Sequence

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<400> 176216
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176217
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW40040

<400> 176217
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

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ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

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<212> RNA
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ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

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ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

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accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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<210> 176220
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<400> 176221
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ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176222
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40106

<400> 176222
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcc ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176223
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW40117

<400> 176223
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176224
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40128

<400> 176224
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176225
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW40139

<400> 176225
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176226
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABW40150

<400> 176226
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176227
<211> 1413

<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40161

<400> 176227
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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<210> 176228
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABW40172

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176229
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40183

<400> 176229
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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<210> 176230
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40194

<400> 176230
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176231
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40205

<400> 176231
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176232
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40216

<400> 176232
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gccccccaacu uccacuacga ggagugcagc 840

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176233
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40227

<400> 176233
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176234
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40238

<400> 176234
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176235
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40249

<400> 176235
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176236
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40260

<400> 176236
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176237
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABW40271

<400> 176237

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagc acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176238

<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40282

<400> 176238
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176239
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40293

<400> 176239
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW40315

<400> 176241
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176242
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW40337

<400> 176243
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40359

<400> 176244
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176245
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW40370

<400> 176245
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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neuraminidase__InfluenzaA__ABW40403

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<220>
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<400> 176247

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176248
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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neuraminidase__InfluenzaA__ABW40436

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<400> 176250
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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neuraminidase__InfluenzaA__ABW40469

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW40491

<400> 176253
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW40502

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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neuraminidase__InfluenzaA__ABW40513

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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<212> RNA
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neuraminidase__InfluenzaA__ABW40524

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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<210> 176257
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<212> RNA
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<223> derived and/or modified CDS sequence (opt4) from
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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neuraminidase__InfluenzaA__ABW40557

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176259
<211> 1413
<212> RNA
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<220>
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<400> 176259
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176260
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW40579

<400> 176260
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccaa caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176261
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40601

<400> 176261
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcaucaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176262
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW40612

<400> 176262
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176263
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW40623

<400> 176263
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176264
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABW40634

<400> 176264
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176265
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40645

<400> 176265
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176266
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW40656

<400> 176266
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176267
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW40667

<400> 176267
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW40678

<400> 176268
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176269
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW71297

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176270
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<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW71308

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176271
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW71319

<400> 176271
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176272
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW71330

<400> 176272
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176273
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABW71341

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggcugggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<211> 1410
<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa ccggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW71363

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW71374

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW71385

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176278
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW71396

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cgugcagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176279
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<212> RNA
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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagau cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176280
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABW71418

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176281
<211> 1413

<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW71440

<400> 176281
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176282
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW71451

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176283
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW71462

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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neuraminidase__InfluenzaA__ABW80981

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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neuraminidase__InfluenzaA__ABW81474

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ggcagccaga acuacaccgg caucugcaac cagaagauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacuucaac aacaccaacg ugguggccgg caaggacaag 240

cccagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcaugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176287
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81475

<400> 176287
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

agcagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagccugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176288
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81477

<400> 176288
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugagc gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

cccgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176289
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81478

<400> 176289
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga acaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176290
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW81479

<400> 176290
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagaagauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

cccagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcaucaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176291
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABW81480

<400> 176291

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ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176292

<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81481

<400> 176292
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagaagauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

cccagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176293
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81482

<400> 176293
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagaagauca ucaccuacga gaacagaacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

cccagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuucagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgagaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176294
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABW81483

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176295
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81484

<400> 176295
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcaaccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caagggcaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176296
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81487

<400> 176296
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucau ccagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176297
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW81488

<400> 176297
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176298
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81489

<400> 176298
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176299
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81490

<400> 176299
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaag accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176300
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81491

<400> 176300
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcugggag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176301
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81492

<400> 176301

augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cugggccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176302
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABW81493

<400> 176302
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176303
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81494

<400> 176303
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176304
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81495

<400> 176304
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176305
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176305
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcugggag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176306
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81498

<400> 176306
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcugggag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176307
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81499

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cagagacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176308
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW81500

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgcc 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176309
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW81501

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagaagauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagcg ugagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176310
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86324

<400> 176310
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176311
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86335

<400> 176311
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg uggugaccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176312
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABW86346

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176313
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86357

<400> 176313
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176314
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86368

<400> 176314
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176315
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86379

<400> 176315
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176316
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86390

<400> 176316
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176317
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86401

<400> 176317
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176318
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86412

<400> 176318
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176319
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86423

<400> 176319
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucgcc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176320
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86434

<400> 176320
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176321
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86445

<400> 176321
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176322
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86456

<400> 176322
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176323
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86467

<400> 176323
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176324
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<212> RNA

<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176326
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<211> 1413
<212> RNA
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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW86522

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176329
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW86533

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176331
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<220>
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ABW86566

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccgu gaucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176333
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW86609

<400> 176333
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176334
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW91188

<400> 176334
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcaacuu ccuggugaag caggacgugg uggccaugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176335
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW91210

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug auccugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176336
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW91221

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176337
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW91232

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agagcaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176338
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABW91243

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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91254

<400> 176339
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91265

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176341
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91276

<400> 176341
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgaca ucuucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagaccau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<212> RNA
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<220>
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgcc 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91331

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<220>
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neuraminidase__InfluenzaA__ABW91342

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg uggugaccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

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ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176352
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc aucugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91408

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcaucaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91419

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176355
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<220>
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neuraminidase__InfluenzaA__ABW91430

<400> 176355

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcagcgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91452

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91463

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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<210> 176359
<211> 1413
<212> RNA
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<220>
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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<210> 176360
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<212> RNA
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176361
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91496

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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<210> 176362
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91507

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176363
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW91518

<400> 176363
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176364
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW91529

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176365
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW91540

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

uggaugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176366
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91551

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaacu ucccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91562

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176368
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91584

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABW91606

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176373
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<212> RNA
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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176374
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABW91650

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176375
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX10517

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agccugaugc ugcagaucgg caaccugauc agcaucuggg ugagccacag cauccacacc 120

ggcaaccagc acaaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

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<212> RNA
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABX58242

<400> 176377

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agccugaugc ugcagaucgg caacaucauc agcaucugga ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<211> 1413
<212> RNA
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<220>
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caagggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaac 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcagaggca gcugcaaccc cgugaccgug 1020

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucau caucgacaag uga 1413

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<220>
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neuraminidase__InfluenzaA__ABX58264

<400> 176379
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176380
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58275

<400> 176380
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176381
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58286

<400> 176381
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176382
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58297

<400> 176382
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagaagauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176383
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58308

<400> 176383
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcaucaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac ggcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176384
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58319

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176385
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58352

<400> 176385
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcaucaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176386
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABX58363

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176387
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58385

<400> 176387
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176388
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58396

<400> 176388
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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<212> RNA
<213> Artificial Sequence

<220>
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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<212> RNA
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176391
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABX58451

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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<220>
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neuraminidase__InfluenzaA__ABX58473

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<220>
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacag aaccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176398
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58506

<400> 176398
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176399
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58528

<400> 176399
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176400
<211> 1413
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58539

<400> 176400
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176401
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58550

<400> 176401
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac cguggacaag uga 1413

<210> 176402
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58561

<400> 176402
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176403
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABX58572

<400> 176403
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176404
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58583

<400> 176404
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176405
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58594

<400> 176405
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176406
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58605

<400> 176406
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176407
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABX58616

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176408
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABX58627

<400> 176408
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176409
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABX58638

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176410
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ABX58682

<400> 176410
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176411
<211> 1413

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58693

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176412
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABX58704

<400> 176412
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcaucaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176413
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<212> RNA
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neuraminidase__InfluenzaA__ABX58715

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caagggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaac 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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<210> 176414
<211> 1350
<212> RNA
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neuraminidase__InfluenzaA__ABY19420

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ggcaaccaga accaggugga gcccaucauc aacaccaacu uccugaccgg caaggccgug 180

gccagcauca cccuggccgg caacagcagc cugugcccca ucagaggcug ggccauccac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucagcau cgacaaguga 1350

<210> 176415
<211> 1350
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABY19421

<400> 176415
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ggcaaccaga accaggugga gcccaucauc aacaccaacu uccugaccgg caaggccgug 180

gccagcauca cccuggccgg caacagcagc cugugcccca ucagaggcug ggccauccac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucagcau cgacaaguga 1350

<210> 176416
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<212> RNA
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neuraminidase__InfluenzaA__ABY51020

<400> 176416
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accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc ccugaccgug 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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<210> 176417
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABY51031

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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176418
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABY51042

<400> 176418
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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<210> 176419
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacagagcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176420
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABY51064

<400> 176420
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caagggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaac 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcagaggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucau caucgacaag uga 1413

<210> 176421
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABY51075

<400> 176421

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176422
<211> 1413
<212> RNA
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<220>
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agcaucaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176423
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<220>
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neuraminidase__InfluenzaA__ABY51097

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcgu ggagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176424
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ABY51108

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<211> 1413
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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176426
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABY51130

<400> 176426
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176427
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABY51141

<400> 176427
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176428
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABY51152

<400> 176428
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176429
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABY51163

<400> 176429
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga uccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176430
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABY51174

<400> 176430
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176431
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABY51185

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176432
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABY51196

<400> 176432
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176433
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176434
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABY51240

<400> 176434
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agccugaugc ugcagaucgg caacaucauc agcgugugggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug gagcaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

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<210> 176435
<211> 1413
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<220>
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neuraminidase__InfluenzaA__ABY51251

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccagg ugggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacaagcu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acgccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176436
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABY51262

<400> 176436
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176437
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABY51273

<400> 176437
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176438
<211> 1350
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ABY76285

<400> 176438
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccaga gacaggccga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cgugagcccc 960

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gccgagcugc ccuucaccau cgacaaguga 1350

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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABY81352

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agccugaucc ugcagaucgg cagcaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggccag gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176440
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ABY81363

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagauc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176441
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABY81374

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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176442
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176443
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ABY81407

<400> 176443

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACA24505

<400> 176444
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176445
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACA24516

<400> 176445
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176446
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACA24527

<400> 176446
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176447
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACA24692

<400> 176447
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucagcc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcaaguacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aacgaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176448
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACA24703

<400> 176448
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac aucaccaucg agaaggagac cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaacgcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagauacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176449
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACA33539

<400> 176449
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176450
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACA33540

<400> 176450
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176451
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACA33582

<400> 176451
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176452
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACA33622

<400> 176452
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176453
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACA96522

<400> 176453
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176454
<211> 1362
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACC55274

<400> 176454
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ugcuuccuga ugcagaucgc cauccuggcc augaccguga cccugcacuu cagacagaac 120

gagugcagca ucagcgccaa cagccaggug gugcccugcg agcccaccac cgagaaggag 180

gugugcagca agguggugga cuacagaagc uggagcaagc cccagugcca gaucaccggc 240

uucgcccccu ucagcaagga caacagcauc agacugagcg ccggcggcga caucuggauc 300

accagagagc ccuacgugag cugcgacacc agcaagugcu accaguucgc ccugggccag 360

ggcaccaccc uggacaacga gcacagcaac ggcaccaucc acgacagaau cccccacaga 420

acccugcuga ugaacgagcu gggcgugccc uuccaccugg gcaccagaca ggugugcauc 480

gccuggagca gcagcagcug ccacgacggc aaggccuggc ugcacgugug cgugaccggc 540

gacgacagaa acgccaccgc cagcuucauc uacaacggca ugcuggugga cagcaucggc 600

agcuggagcc agaacauccu gagaacccag gagagcgagu gcgugugcau caacggcagc 660

ugcaccgugg ugaugaccga cggcagcgcc agcggcaagg ccgacaccag aauccuguuc 720

gugaaggagg gcaagaucgu gcacaucagc ccccugagcg gcagcgccca gcacaucgag 780

gagugcagcu gcuaccccag auaccccaac gugagaugcg ugugcagaga caacuggaag 840

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ugcagagacc ccaacgagga gagaggcaac cccggcguga agggcugggc cuucgacagc 1020

ggcgacgacg uguggauggg cagaaccauc agcagagaca gcagaagcgg cuacgagacc 1080

uucagaguga ucggcggcug gaccaccgcc aacagcaaga gccagaccaa cagacaggug 1140

aucguggaca acaacaacug gagcggcuac agcggcaucu ucagcgugga gcacaagagc 1200

ugcaucaaca gaugcuucua cguggagcug aucagaggca gacccaagga gaccagagug 1260

ugguggacca gcaacagcau cgugguguuc ugcggcacca gcggcaccua cggcaccggc 1320

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<210> 176455
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACC61967

<400> 176455

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176456

<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD11077

<400> 176456
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggugacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaacgug 1020

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agaaccaaga gcaacaacag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caugagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugccccugac caucgacaag uga 1413

<210> 176457
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD11078

<400> 176457
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

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gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccagagaga agaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugccccugac caucgacaag uga 1413

<210> 176458
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD11079

<400> 176458
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg ugguggccgg caaggacacc 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugaucaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcccc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugccccugac caucgacaag uga 1413

<210> 176459
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD56116

<400> 176459
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176460
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD56127

<400> 176460
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176461
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD56261

<400> 176461
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176462
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD56272

<400> 176462
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176463
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD56283

<400> 176463
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176464
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD56305

<400> 176464
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176465
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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<400> 176465

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugauggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176466
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACD56327

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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccag caagugccac caguucgccc ugggccaggg caccacccug 420

gagaacaagc acagcaacgg caccaagcac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cggcggcaga cugguggaca gcaucgugag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

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cccgugaucg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacgacgac agcagcagca acagcaacug cagagacccc 1020

aacaacgaga gaggcaaccc cggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176467
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD85190

<400> 176467
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga cagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176468
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACD85201

<400> 176468
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucagcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga cagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176469
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACD85212

<400> 176469
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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaagg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176470
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD85223

<400> 176470
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176471
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACD85234

<400> 176471
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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc gacggcgaca ucugggugac cagagagccc 360

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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<210> 176472
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD85245

<400> 176472
augaacccca accagaagau caucaccauc ggcagcguga gccugaucau cgccaccgug 60

ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaga 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

aacaacgaga gaggcaacca gggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

uggaugggca gaaccaucag caaggaccug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

gacgacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176473
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD85454

<400> 176473
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ggcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga aacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176474
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD85465

<400> 176474
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ggcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176475
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD85487

<400> 176475
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga aacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176476
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD85498

<400> 176476
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176477
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD85509

<400> 176477
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga aacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcagcag aggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176478
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD85520

<400> 176478
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ggcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176479
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD85553

<400> 176479
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ggcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176480
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACD85564

<400> 176480
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaccgccca ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176481
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACD85575

<400> 176481
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176482
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACD85586

<400> 176482
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176483
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACD93582

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ugcuucuuca ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga ggcagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176484
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF09403

<400> 176484
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176485
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF22151

<400> 176485
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176486
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACF22246

<400> 176486
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176487
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF22257

<400> 176487
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176488
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF22279

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176489
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF22290

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176490
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACF22301

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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

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cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

aacaacgaga gaggcaacca gggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

uggaugggca gaaccaucag caaggaccug agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176491
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF22312

<400> 176491
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176492
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176492
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccuacg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

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ggcggcugga gcacccccaa cagcaagagc cagaucaaca gacaggugau cguggacagc 1200

gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176493
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF22334

<400> 176493
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176494
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF22367

<400> 176494
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176495
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACF22378

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176496
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF22389

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgugcccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACF22400

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176498
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ACF22411

<400> 176498
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176499
<211> 1413

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF33772

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

acccccguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaag accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagaau cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaucg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF33778

<400> 176500
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcauccccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccaga acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagauacgu gugcagcggc 960

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176501
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF33785

<400> 176501
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gugagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaccgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaaccccaa cagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176502
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF33787

<400> 176502
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

acccccguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaag accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccgg caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau ggagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagaau cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176503
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF33798

<400> 176503
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176504
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACF41672

<400> 176504
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa ccggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176505
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF41683

<400> 176505
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176506
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF41749

<400> 176506
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg gcaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176507
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF41760

<400> 176507
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176508
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF41771

<400> 176508
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176509
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACF41793

<400> 176509

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176510

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF41804

<400> 176510
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176511
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF41826

<400> 176511
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176512
<211> 1365
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF41837

<400> 176512
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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagaacauca ucaccuacaa gaacagcacc 180

ugggugaagg acaccaccag cgugauccug accggcaaca gcagccugug ccccaucaga 240

ggcugggcca ucuacagcaa ggacaacagc aucagaaucg gcagcaaggg cgacguguuc 300

gugaucagag agcccuucau cagcugcagc caccuggagu gcagaaccuu cuuccugacc 360

cagggcgccc ugcugaacga caagcacagc agcggcaccg ugaaggacag aagccccuac 420

agagcccuga ugagcugccc cgugggcgag gcccccagcc ccuacaacag cagauucgag 480

agcguggccu ggagcgccag cgccugccac gacggcaugg gcuggcugac caucggcauc 540

agcggccccg acaacggcgc cguggccgug cugaaguaca acggcaucau caccgagacc 600

aucaagagcu ggagaaagaa gauccugaga acccaggaga gcgagugcgc cugcgugaac 660

ggcagcugcu ucaccaucau gaccgacggc cccagcgacg gccuggccag cuacaagauc 720

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ggcgugugga ucggcagaac caagagccac agcagcagac acggcuucga gaugaucugg 1080

gaccccaacg gcuggaccga gaccgacagc aaguucagcg ugagacagga cgugguggcc 1140

augaccgacu ggagcggcua cagcggcagc uucgugcagc accccgagcu gaccggccug 1200

gacugcauga gacccugcuu cuggguggag cugaucagag gcagacccaa ggagaagacc 1260

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<210> 176513
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACF41881

<400> 176513
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176514
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF41892

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176515
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF41903

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176516
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF41914

<400> 176516
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176517
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF41925

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176518
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF41936

<400> 176518
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

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<210> 176519
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACF54392

<400> 176519
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgacagcgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176520
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACF54403

<400> 176520
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176521
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF54414

<400> 176521
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176522
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF54425

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF54436

<400> 176523
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176524
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACF54447

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF54469

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176526
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACF54480

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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

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ggcgccaaca ucaacuucau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF54502

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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

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<210> 176528
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACF54513

<400> 176528
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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugagcuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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cccgugaucg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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aacaacgaga gaggcaaccc cggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

uggaugggca gaaccaucaa caaggacagc agaagcggcu acgagaccuu caaggugauc 1140

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aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176529
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF54524

<400> 176529
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ugcuucuuca ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugagcuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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cccgugaucg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaacgacgac agcagcagca acagcaacug cagagacccc 1020

aacaacgaga gaggcaaccc cggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

uggaugggca gaaccaucaa caaggacagc agaagcggcu acgagaccuu caaggugauc 1140

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aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176530
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF54535

<400> 176530
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucacca agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176531
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACF54557

<400> 176531

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacauga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176532

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF54568

<400> 176532
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176533
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF54579

<400> 176533
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176534
<211> 1362
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACF54601

<400> 176534
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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcaaccaga accacaccgg caucugcaac cagggcagca ucaccuacaa gguggugggcc 180

ggccaggaca gcaccagcgu gauccugacc ggcaacagca gccugugccc caucagaggc 240

ugggccaucc acagcaagga caacggcauc agaaucggca gcaagggcga cguguucgug 300

aucagagagc ccuucaucag cugcagccac cuggagugca gaaccuucuu ccugacccag 360

ggcgcccugc ugaacgacaa gcacagcaga ggcaccuuca aggacagaag ccccuacaga 420

gcccugauga gcugccccgu gggcgaggcc cccagccccu acaacagcag auucgagagc 480

guggccugga gcgccagcgc cugccacgac ggcaugggcu ggcugaccau cggcaucagc 540

ggccccgacg acggcgccgu ggccgugcug aaguacaacg gcaucaucac cgagaccauc 600

aagagcugga gaaagaacau ccugagaacc caggagagcg agugcaccug cgugaacggc 660

agcugcuuca ccaucaugac cgacggcccc agcgacggcc uggccagcua caagaucuuc 720

aagaucgaga agggcaaggu gaccaagagc aucgagcuga acgcccccaa cagccacuac 780

gaggagugca gcugcuaccc cgacaccggc aaggugaugu gcgugugcag agacaacugg 840

cacggcagca acagacccug ggugagcuuc gaccagaacc uggacuacaa gaucggcuac 900

aucugcagcg gcguguucgg cgacaacccc agacccaagg acggcaccgg cagcugcggc 960

cccgugagcg ccgacggcgc caacggcgug aagggcuuca gcuacaagua cggcaacggc 1020

guguggaucg gcagaaccaa gagcgacagc agcagacacg gcuucgagau gaucugggac 1080

cccaacggcu ggaccgagac cgacagcaga uucagcauga gacaggacgu gguggccaug 1140

accgacagaa gcggcuacag cggcagcuuc gugcagcacc ccgagcugac cggccuggac 1200

ugcaugagac ccugcuucug gguggagcug aucagaggcc ugcccgagga gaacgccauc 1260

uggaccagcg gcagcaucau cagcuucugc ggcgugaaca gcgacaccgu ggacuggagc 1320

uggcccgacg gcgccgagcu gcccuucacc aucgacaagu ga 1362

<210> 176535
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACG50700

<400> 176535
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagc accaggccga gcccaucagc aacaccaacu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcccc cugugcccca ucagcggcug ggccgugcac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 720

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aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggacag caacggcugg 1080

accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 176536
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACG70145

<400> 176536
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa ccggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176537
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACG70156

<400> 176537
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176538
<211> 1410
<212> RNA
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<220>
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gaguucaaca gcccccccaa caaccagaug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccaagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgccaga ggcagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcgaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176539
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACG80411

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccagaug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgccggc ggcagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggacg gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcgaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176540
<211> 1407
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACG80421

<400> 176540
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccagaug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcgacac cgccagagac agaacccccu acagaacccu gcugaugaac 480

gagcugggcg ugcccuucca ccugggcacc aagcaggugu gcaucgccug gagcagcagc 540

agcugccacg acggcaaggc cuggcugcac gugugcauca ccggcgacga caagaacgcc 600

accgccagcu ucaucuacaa cggcagacug guggacagcg uggugagcug gagcaaggag 660

auccugagaa cccaggagag cgagugcgug ugcaucaacg gcaccugcac cguggugaug 720

accgacggca gcgccagcgg cgaggccgac accaagaucc uguucaucga ggagggcaag 780

aucgugcaca ccagcacccu gagcggcagc gcccagcacg uggaggagug cagcugcuac 840

cccagauacc ccggcgugag augcgugugc agagacaacu ggaagggcag caacagaccc 900

aucguggaca ucaacaucaa ggaccacagc aucgugagca gcuacgugug cagcggccug 960

gugggcgaca cccccagaaa gaacgacagc agcagcagca gccacugccu ggaccccaac 1020

aacgaggagg gcggccacgg cgugaagggc ugggccuucg acgacggcaa cgacgugugg 1080

augggcagaa ccaucagcga gaagagcaga cugggcuacg agaccuucaa ggugaucgag 1140

ggcuggagca accccaagag caagcugcag aucaacagac aggugaucgu ggacagaggc 1200

aacagaagcg gcuacagcgg caucuucagc guggagggca agagcugcau caacagaugc 1260

uucuacgugg agcugaucag aggcagaaag gaggagaccg aggugcugug gaccagcaac 1320

agcaucgugg uguucugcgg caccagcggc accuacggca ccggcagcug gcccgacggc 1380

gccgacauca accugaugcc caucuga 1407

<210> 176541
<211> 1407
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACG80427

<400> 176541
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccagaug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcgacac cgccagagac agaacccccu acagaacccu gcugaugaac 480

gagcugggcg ugcccuucca ccugggcacc aagcaggugu gcaucgccug gagcagcagc 540

agcugccacg acggcaaggc cuggcugcac gugugcauca ccggcgacga caagaacgcc 600

accgccagcu ucaucuacaa cggcagacug guggacagcg uggugagcug gagcaaggag 660

auccugagaa cccaggagag cgagugcgug ugcaucaacg gcaccugcac cguggugaug 720

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aucgugcaca ccagcacccu gagcggcagc gcccagcacg uggaggagug cagcugcuac 840

cccagauacc ccggcgugag augcgugugc agagacaacu ggaagggcag caacagaccc 900

aucguggaca ucaacaucaa ggaccacagc aucgugagca gcuacgugug cagcggccug 960

gugggcgaca cccccagaaa gaacgacagc agcagcagca gccacugccu ggaccccaac 1020

aacgaggagg gcggccacgg cgugaagggc ugggccuucg acgacggcaa cgacgugugg 1080

augggcagaa ccaucagcga gaagagcaga cugggcuacg agaccuucaa ggugaucgag 1140

ggcuggagca accccaagag caagcugcag aucaacagac aggugaucgu ggacagaggc 1200

aacagaagcg gcuacagcgg caucuucagc guggagggca agagcugcau caacagaugc 1260

uucuacgugg agcugaucag aggcagaaag gaggagaccg aggugcugug gaccagcaac 1320

agcaucgugg uguucugcgg caccagcggc accuacggca ccggcagcug gcccgacggc 1380

gccgacauca accugaugcc caucuga 1407

<210> 176542
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACG80437

<400> 176542
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca acuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagaucuuca gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176543
<211> 1407
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACG80446

<400> 176543
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccagaug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcgacac cgccagagac agaacccccu acagaacccu gcugaugaac 480

gagcugggcg ugcccuucca ccugggcacc aagcaggugu gcaucgccug gagcagcagc 540

agcugccacg acggcaaggc cuggcugcac gugugcauca ccggcgacga caagaacgcc 600

accgccagcu ucaucuacaa cggcagacug guggacagcg uggugagcug gagcaaggag 660

auccugagaa cccaggagag cgagugcgug ugcaucaacg gcaccugcac cguggugaug 720

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cccagauacc ccggcgugag augcgugugc agagacaacu ggaagggcag caacagaccc 900

aucguggaca ucaacaucaa ggaccacagc aucgugagca gcuacgugug cagcggccug 960

gugggcgaca cccccagaaa gaacgacagc agcagcagca gccacugccu ggaccccaac 1020

aacgaggagg gcggccacgg cgugaagggc ugggccuucg acgacggcaa cgacgugugg 1080

augggcagaa ccaucagcga gaagagcaga cugggcuacg agaccuucaa ggugaucgag 1140

ggcuggagca accccaagag caagcugcag aucaacagac aggugaucgu ggacagaggc 1200

aacagaagcg gcuacagcgg caucuucagc guggagggca agagcugcau caacagaugc 1260

uucuacgugg agcugaucag aggcagaaag gaggagaccg aggugcugug gaccagcaac 1320

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gccgacauca accugaugcc caucuga 1407

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACG80455

<400> 176544
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccagaug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176545
<211> 1407
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACG80464

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccagaug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcgacac cgccagagac agaacccccu acagaacccu gcugaugaac 480

gagcugggcg ugcccuucca ccugggcacc aagcaggugu gcaucgccug gagcagcagc 540

agcugccacg acggcaaggc cuggcugcac gugugcauca ccggcgacga caagaacgcc 600

accgccagcu ucaucuacaa cggcagacug guggacagcg uggugagcug gagcaaggag 660

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cccagauacc ccggcgugag augcgugugc agagacaacu ggaagggcag caacagaccc 900

aucguggaca ucaacaucaa ggaccacagc aucgugagca gcuacgugug cagcggccug 960

gugggcgaca cccccagaaa gaacgacagc agcagcagca gccacugccu ggaccccaac 1020

aacgaggagg gcggccacgg cgugaagggc ugggccuucg acgacggcaa cgacgugugg 1080

augggcagaa ccaucagcga gaagagcaga cugggcuacg agaccuucaa ggugaucgag 1140

ggcuggagca accccaagag caagcugcag aucaacagac aggugaucgu ggacagaggc 1200

aacagaagcg gcuacagcgg caucuucagc guggagggca agagcugcau caacagaugc 1260

uucuacgugg agcugaucag aggcagaaag gaggagaccg aggugcugug gaccagcaac 1320

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gccgacauca accugaugcc caucuga 1407

<210> 176546
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACG80473

<400> 176546
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gaguucaaca gcccccccaa caaccagaug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176547
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACH69559

<400> 176547
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176548
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176549
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACH69581

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176550
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACH69592

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaaccag 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgacc ugaaccugau gcccaucuga 1410

<210> 176551
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACH69603

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ugcuuccuga ugcagaucgu gauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgacc ugaaccugau gcccaucuga 1410

<210> 176552
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACH69614

<400> 176552
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgacc ugaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACI22525

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI22526

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI22527

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176556
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI22528

<400> 176556
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176557
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI22529

<400> 176557
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176558
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI22530

<400> 176558
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176559
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI22532

<400> 176559
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176560
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI22533

<400> 176560
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176561
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI22534

<400> 176561
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176562
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI25727

<400> 176562
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176563
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI25749

<400> 176563
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcacaucuga 1410

<210> 176564
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ACI25760

<400> 176564
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcacaucuga 1410

<210> 176565
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI25771

<400> 176565
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcacaucuga 1410

<210> 176566
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI25782

<400> 176566
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176567
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACI25793

<400> 176567
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgug ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176568
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI25804

<400> 176568
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugugggcg acacccccag aaacgacgac agaagcagca acagcaacug cagaaacccc 1020

aacaacgaga gaggcaacca gggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

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gaccacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176569
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACI26277

<400> 176569
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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugagcuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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aacaacgaga gaggcaaccc cggcgugaag ggcugggccu ucgacaacgg cgacgacgug 1080

uggaugggca gaaccaucaa caaggacagc agaagcggcu acgagaccuu caaggugauc 1140

ggcggcugga gcacccccaa cagcaagagc caggugaaca gacaggugau cguggacaac 1200

aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176570
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI26299

<400> 176570
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176571
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI26321

<400> 176571
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176572
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI26354

<400> 176572
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176573
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI26365

<400> 176573
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176574
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI26376

<400> 176574
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176575
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

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<400> 176575

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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga cagcaggaga ccagagugug guggaccagc 1320

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ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176576

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI26420

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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176577
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI26431

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176578
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI26442

<400> 176578
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaag accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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<210> 176579
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI26453

<400> 176579
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaag accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176580
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI26464

<400> 176580
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ugcuucuuca ugcagaucgc cauccugauc gccaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACI26475

<400> 176581
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176582
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI26486

<400> 176582
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176583
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI26497

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176584
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176584
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176585
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176585

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 176586
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACI26530

<400> 176586
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176587
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI26541

<400> 176587
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176588
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI26552

<400> 176588
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176589
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACI26574

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac aucaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccag caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI26585

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccaaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176591
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI32764

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<220>
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neuraminidase__InfluenzaA__ACI32765

<400> 176592
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacaacacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccag aaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuuca ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176593
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACI32766

<400> 176593
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176594
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI32767

<400> 176594
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cacccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176595
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI32768

<400> 176595
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agccugauga gccagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176596
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176596
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

aucagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176597
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI32770

<400> 176597
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176598
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI32771

<400> 176598
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacaa gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caagggcaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176599
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACI32772

<400> 176599
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACI32773

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176601
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI32774

<400> 176601
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176602
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACI32775

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176603
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32776

<400> 176603
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacaa gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176604
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32777

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacaa gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

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ggcgccgagc ugcccuucgc caucgacaag uga 1413

<210> 176605
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI32778

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176606
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32779

<400> 176606
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176607
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32780

<400> 176607
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176608
<211> 1413
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32781

<400> 176608
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaaggcca ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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<210> 176610
<211> 1413
<212> RNA
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<220>
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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<210> 176611
<211> 1413
<212> RNA
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neuraminidase__InfluenzaA__ACI32784

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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176613
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32787

<400> 176613
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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagaccau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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ggcagcagca ucagcuucug cggcgugaac ggcggcaccg ccgacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176614
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI32788

<400> 176614
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caccugcaac cagagaauca ucaccuacga gaacaacacc 180

ugggugaacc acaccugcgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggugg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caagggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc caugaccgug 1020

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176615
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176615
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccu gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176616
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32791

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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176617
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32793

<400> 176617
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176618
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32794

<400> 176618
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ugcuuccuga cccagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176619
<211> 1410

<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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<210> 176620
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32796

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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<210> 176621
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<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32797

<400> 176621
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcagca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176622
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176622
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaac 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32799

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc aacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caagaacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176624
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI32800

<400> 176624
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176625
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACI32802

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176626
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32803

<400> 176626
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176627
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACI32804

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACI32805

<400> 176628
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176629
<211> 1410
<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACI32806

<400> 176629

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176630

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI32807

<400> 176630
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggaggu gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176631
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32808

<400> 176631
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggagaaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32809

<400> 176632
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176633
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32810

<400> 176633
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176634
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACI32811

<400> 176634
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACI32812

<400> 176635
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc aacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176636
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACI32814

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1350
<212> RNA
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neuraminidase__InfluenzaA__ACJ53848

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ggcaaccagu gccaggccga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 176638
<211> 1350
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACJ53849

<400> 176638
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggccga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 176639
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACJ53853

<400> 176639
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

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neuraminidase__InfluenzaA__ACJ53866

<400> 176640
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

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<212> RNA
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agccugaugc ugcagaucgg caacaugauc agccuguggg ugagccacag cauccagacc 120

ggcaaccagu gccaggccga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

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<212> RNA
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<220>
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggccga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caucagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 176643
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACJ53876

<400> 176643
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggccga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

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ugccugauca ugcagaucgc cgugcuggcc accaccauga cccugcacuu caacgagugc 120

accaacccca gcaacaacca ggccaugccc ugcgagccca ucaucaucga gagaaacaug 180

accgagaucg ugcaccugaa caacaccacc aucgagaagg agagcugccc caagguggcc 240

gaguacaaga acuggagcaa gccccagugc cagaucaccg gcuucgcccc cuucagcaag 300

gacaacagca ucagacugag cgccggcggc gacaucuggg ugaccagaga gcccuacgug 360

agcugcggcc ugggcaacug cuaccaguuc gcccugggcc agggcaccac ccugaacaac 420

aagcacagca acgacaccau ccacgacaga agcccccaca gaacccugcu gaugaacgag 480

cugggcgugc ccuuccaccu gggcaccaag caggugugca ucgccuggag cagcagcagc 540

ugccacgacg gcaaggccug gcugcacgug ugcgugaccg gcgacgacag aaacgccacc 600

gccagcauca ucuacgacgg caugcugacc gacagcaucg gcagcuggag caagaacauc 660

cugagaaccc aggagagcga gugcgugugc aucaacggca ccugcaccgu ggugaugacc 720

gacggcagcg ccagcggcag agccgacacc aagauccugu ucaucagaga gggcaagauc 780

gugcacauca gcccccugag cggcagcgcc cagcacgugg aggagugcag cugcuacccc 840

agauaccccg aggugagaug cgugugcaga gacaacugga agggcagcaa cagacccgug 900

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ggcagaacca ucaagaagga cagcagaagc ggcuacgaga ccuucagagu gguggggcggc 1140

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uggagcggcu acagcggcau cuucagcgug gagggcaaga ccugcaucaa cagaugcuuc 1260

uacguggagc ugaucagagg cagaccccag gagaccagag uguggugggac cagcaacagc 1320

aucaucgugu ucugcggcac cagcggcacc uacggcaccg gcagcuggcc cgacggcgcc 1380

aacaucaacu ucaugagcau cuga 1404

<210> 176645
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACK99424

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug auccccugcc agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccaaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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<220>
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agccugaccc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagauu cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggcaga cccagagaga acaccaccau cuggaccagc 1320

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<210> 176648
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<220>
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gagugcaaca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccaaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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neuraminidase__InfluenzaA__ACK99468

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcauga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg ccugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacagcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcagaguga ccaagagcau cgagcuggac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176650
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACK99479

<400> 176650
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugcugggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 176651
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACL12066

<400> 176651
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgcc 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176652
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACL12132

<400> 176652
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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aacaacgaga agggcagcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACL12154

<400> 176653
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaag accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac agagagggca gcugcaaccc cgugaccauc 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176654
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACL12165

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176655
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACL12176

<400> 176655
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACL12198

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcacccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACL12209

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ACL12220

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176659
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACL12242

<400> 176659
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176660
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACL12264

<400> 176660
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agccugaucc ugcagaucgu gaacaucauc agcaucuggg ugagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca gaaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcuggac gcccccaaca gccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcgaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagauu cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176661
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN32275

<400> 176661
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugauggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 176662
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN32286

<400> 176662
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176663
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACN32493

<400> 176663
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACN32526

<400> 176664
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176665
<211> 1410

<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACN32537

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176666
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN32807

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcc ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176667
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN32818

<400> 176667
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ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176668
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACN32829

<400> 176668
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176669
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN32840

<400> 176669
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ugaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176670
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN32851

<400> 176670
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176671
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN32862

<400> 176671
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176672
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN32873

<400> 176672
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176673
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN32884

<400> 176673
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176674
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACN32895

<400> 176674
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176675
<211> 1410
<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACN32906

<400> 176675

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176676

<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACN32917

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gaguucaaca gcccccccaa caaccaggug augcugugca agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176677
<211> 1410
<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176678
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176680
<211> 1410
<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

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cccaucgugg acaucaacau caccgaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaacaucau gcccaucuga 1410

<210> 176681
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN32972

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176682
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN32994

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176683
<211> 1410
<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcgagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACN33049

<400> 176685

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176687
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN33082

<400> 176687
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176688
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN33093

<400> 176688
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176689
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACN33104

<400> 176689
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176690
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN33115

<400> 176690
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176691
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACN33126

<400> 176691
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg cagcagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176692
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN33148

<400> 176692
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176693
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN33159

<400> 176693
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagaa gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176694
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN33170

<400> 176694
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176695
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN33181

<400> 176695
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176696
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<220>
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gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaccgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176698
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACN42984

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176699
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN42995

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176700
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACN43006

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caacagagug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176701
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACN43017

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176703
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<220>
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neuraminidase__InfluenzaA__ACN43039

<400> 176703
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ACN43050

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176705
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<220>
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neuraminidase__InfluenzaA__ACN43061

<400> 176705
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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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aacagcgugg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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<220>
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gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaac 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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<210> 176708
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176710
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACN50245

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug gugcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcgacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176711
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACN72609

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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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ggcaaccaga accagaccga gaccugcaac cagagcguga ucaucuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaacaacu ucguggccga gcagaccgug 240

gugcccguga agcugguggg cagcagcccc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg cagcagcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacgac aucaucaccg acaccaucaa gagcuggaag 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcc ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gaucgagaag 780

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neuraminidase__InfluenzaA__ACN76503

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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neuraminidase__InfluenzaA__ACO36345

<400> 176714
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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176715
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176716
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO36367

<400> 176716
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga aacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuucg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176717
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACO36400

<400> 176717
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176718
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ACO36411

<400> 176718
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ggcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176719
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO36422

<400> 176719
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga ggcagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176720
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO36433

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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176721
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACO36444

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagaa gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACO36466

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgccua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ACO36477

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176724
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACO36499

<400> 176724
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176725
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACO36510

<400> 176725
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176726
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ACO36554

<400> 176727
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACO36565

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176729
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<220>

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176730

<211> 1410
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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neuraminidase__InfluenzaA__ACO36609

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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<220>
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neuraminidase__InfluenzaA__ACO36620

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

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neuraminidase__InfluenzaA__ACO36631

<400> 176733
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176734
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176734
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176735
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACO36675

<400> 176735
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ugccuguuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176736
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO36686

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176737
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO37125

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaug cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176738
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO94511

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagcaacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176739
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO94512

<400> 176739

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176740
<211> 1410
<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176741
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACO94675

<400> 176741
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176742
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACO94686

<400> 176742
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccac caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcggccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaga ucaaccugau gcccaucuga 1410

<210> 176743
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACO94697

<400> 176743
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176744
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO94708

<400> 176744
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176745
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO94719

<400> 176745
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcggccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaga ucaaccugau gcccaucuga 1410

<210> 176746
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO94741

<400> 176746
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggaga gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176747
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACO94763

<400> 176747
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176748
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO94774

<400> 176748
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

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aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcauggc cuggagcagc 540

agcagcugcc acgacggcag agccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176749
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACO94785

<400> 176749
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugca agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176750
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO94796

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176751
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACO94807

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agccugaucc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaaca acaccuacgu gaacaucaac aacaccaacg ugguggccga gaaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcacc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagaccau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcggcaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176752
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACO94818

<400> 176752
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ggcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176753
<211> 1365
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACO94829

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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagaacauca ucaccuacaa gaacagcacc 180

ugggugaagg acaccaccag cgugauccug accggcaaca gcagccugug ccccaucaga 240

ggcugggcca ucuacagcaa ggacaacagc aucagaaucg gcagcaaggg cgacguguuc 300

gugaucagag agcccuucau cagcugcagc caccuggagu gcagaaccuu cuuccugacc 360

cagggcgccc ugcugaacga caagcacagc agcggcaccg ugaaggacag aagccccuac 420

agagcccuga ugagcugccc cgugggcgag gcccccagcc ccuacaacag cagauucgag 480

agcguggccu ggagcgccag cgccugccac gacggcaugg gcuggcugac caucggcauc 540

agcggccccg acaacggcgc cguggccgug cugaaguaca acggcaucau caccgagacc 600

aucaagagcu ggagaaagaa gauccugaga acccaggaga gcgagugcgc cugcgugaac 660

ggcagcugcu ucaccaucau gaccgacggc cccagcgacg gccuggccag cuacaagauc 720

uucaagaucg agaagggcaa ggugaccaag agcaucgagc ugaacgcccc caacagccac 780

uacgaggagu gcagcugcua ccccgacacc ggcaagguga ugugcgugug cagagacaac 840

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ggcgugugga ucggcagaac caagagccac agcagcagac acggcuucga gaugaucugg 1080

gaccccaacg gcuggaccga gaccgacagc aaguucagcg ugagacagga cgugguggcc 1140

augaccgacu ggagcggcua cagcggcagc uucgugcagc accccgagcu gaccggccug 1200

gacugcauga gacccugcuu cuggguggag cugaucagag gcagacccaa ggagaagacc 1260

aucuggacca gcgccagcag caucagcuuc ugcggcguga acagcgacac cguggacugg 1320

agcuggcccg acggcgccga gcugcccuuc agcaucgaca aguga 1365

<210> 176754
<211> 1365
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO94840

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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagaacauca ucaccuacaa gaacagcacc 180

ugggugaagg acaccaccag cgugauccug accggcaaca gcagccugug ccccaucaga 240

ggcugggcca ucuacagcaa ggacaacagc aucagaaucg gcagcaaggg cgacguguuc 300

gugaucagag agcccuucau cagcugcagc caccuggagu gcagaaccuu cuuccugacc 360

cagggcgccc ugcugaacga caagcacagc agcggcaccg ugaaggacag aagccccuac 420

agagcccuga ugagcugccc cgugggcgag gcccccagcc ccuacaacag cagauucgag 480

agcguggccu ggagcgccag cgccugccac gacggcaugg gcuggcugac caucggcauc 540

agcggccccg acaacggcgc cguggccgug cugaaguaca acggcaucau caccgagacc 600

aucaagagcu ggagaaagaa gauccugaga acccaggaga gcgagugcgc cugcgugaac 660

ggcagcugcu ucaccaucau gaccgacggc cccagcgacg gccuggccag cuacaagauc 720

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ggcgugugga ucggcagaac caagagccac agcagcagac acggcuucga gaugaucugg 1080

gaccccaacg gcuggaccga gaccgacagc aaguucagcg ugagacagga cgugguggcc 1140

augaccgacu ggagcggcua cagcggcagc uucgugcagc accccgagcu gaccggccug 1200

gacugcauga gacccugcuu cuggguggag cugaucagag gcagacccaa ggagaagacc 1260

aucuggacca gcgccagcag caucagcuuc ugcggcguga acagcgacac cguggacugg 1320

agcuggcccg acggcgccga gcugcccuuc agcaucgaca aguga 1365

<210> 176755
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACO94851

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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caucgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACO94873

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

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<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACO94884

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ACO94906

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA
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<220>
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176760
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<212> RNA
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neuraminidase__InfluenzaA__ACO94928

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176761
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<212> RNA
<213> Artificial Sequence

<220>
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<400> 176761
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaucagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACO94950

<400> 176762
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagcu gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACO95156

<400> 176765
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagac cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176767
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACO95185

<400> 176767
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176768
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACO95196

<400> 176768
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO95207

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176770
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACO95218

<400> 176770
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176771
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<212> RNA
<213> Artificial Sequence

<220>
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<400> 176771
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176772
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO95240

<400> 176772
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176773
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACO95262

<400> 176773

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcagca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176774

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO95273

<400> 176774
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176775
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO95306

<400> 176775
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176776
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO95385

<400> 176776
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176777
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO95407

<400> 176777
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176778
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO95418

<400> 176778
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176779
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO95429

<400> 176779
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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176780
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACO95440

<400> 176780
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176781
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO95462

<400> 176781
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcugaucuga 1410

<210> 176782
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO95484

<400> 176782
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176783
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACO95495

<400> 176783

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176784
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACO95506

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176785
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACO95517

<400> 176785
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACO95539

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc aacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176787
<211> 1413
<212> RNA
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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176788
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACP41952

<400> 176788
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176789
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACP44158

<400> 176789
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176790
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACP44195

<400> 176790
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176791
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACP44217

<400> 176791
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176792
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACP44228

<400> 176792
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176793
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACP44239

<400> 176793
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176794
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACP44250

<400> 176794
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ugcuucuuca ugcagaucgc cauccugaug accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagcug agaagcggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176795
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACP44261

<400> 176795
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacaugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176796
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACP44272

<400> 176796
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176797
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACQ55360

<400> 176797
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176798
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACQ63236

<400> 176798
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176799
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176801
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACQ63262

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaagug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaagug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176808
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACQ65761

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

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<210> 176809
<211> 1410
<212> RNA
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<220>
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<400> 176809
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 176810
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACQ73395

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 176811
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACQ73396

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176812
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACQ76291

<400> 176812
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176813
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<220>
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neuraminidase__InfluenzaA__ACQ76298

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176814
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neuraminidase__InfluenzaA__ACQ76308

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176815
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neuraminidase__InfluenzaA__ACQ76316

<400> 176815
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176816
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACQ76322

<400> 176816
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 176817
<211> 1410

<212> RNA
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neuraminidase__InfluenzaA__ACQ76328

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176818
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACQ76335

<400> 176818
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176819
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176820
<211> 1410
<212> RNA
<213> Artificial Sequence

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neuraminidase__InfluenzaA__ACQ76351

<400> 176820
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176821
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACQ76359

<400> 176821
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176822
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<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176823
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<220>
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neuraminidase__InfluenzaA__ACQ76367

<400> 176823
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176824
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<220>
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neuraminidase__InfluenzaA__ACQ76379

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacaa gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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neuraminidase__InfluenzaA__ACQ76385

<400> 176825
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176826
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<212> RNA
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<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACQ76388

<400> 176826
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176827
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACQ76403

<400> 176827

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176828

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACQ76407

<400> 176828
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176829
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACQ77603

<400> 176829
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacgu gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 176830
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACQ83309

<400> 176830
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176831
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACQ84460

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176832
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACQ84470

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ACQ84480

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agccugcugc ugcagaucgg caacaucgug agccugugga ucagccacag caucaagacc 120

ggcgagaaga accacagcga gaucugcaac cagaacauca ucaccuacga gaacaagacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaaca ucgccgacgg ccagggcgug 240

accagcauca uccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgaca ucuucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacagac acagcaacgg caccgugaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaccg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaagaucc ugagaaccca ggagagcgag ugcgugugca ucaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaag 780

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agacccuggg ugagcuucga ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag aagcaacgac ggcaagggca acugcggccc cgugcugagc 1020

aacggcgcca acggcgugaa gggcuucagc uucagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cguggacagc gagaccgcca gcuggagcug gcccgacggc 1380

gccgaccugc ccuucaccau cgacaaguga 1410

<210> 176834
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neuraminidase__InfluenzaA__ACQ89891

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagaggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<211> 1410
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<220>
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neuraminidase__InfluenzaA__ACQ89918

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176836
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACQ89919

<400> 176836
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagcagaag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 176837
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176837

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176838
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176839
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACQ89922

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176840
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACQ89923

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176841
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176841
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176842
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACQ99624

<400> 176842
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176843
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACQ99626

<400> 176843
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176844
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACQ99627

<400> 176844
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176845
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176845
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176846
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACQ99629

<400> 176846
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176847
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176847
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176848
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACQ99632

<400> 176848
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176849
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACQ99633

<400> 176849
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176850
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACQ99635

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176851
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACQ99636

<400> 176851
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176852
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacgagcag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgagaaga gccaccccaa ggugugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaaca ucgccgccgg ccagggcgug 240

acccccauca uccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgaca ucuucgugau gagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacagac acagcaacgg caccgugaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaagaucc ugagaaccca ggagagcgag ugcgugugca ucaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggccag gccagcuaca agcuguucaa gauggagaag 780

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agacccuggg ugagcuucga ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag aagcaacgac ggcaagggca acugcggccc cgugcugagc 1020

aacggcgcca acggcgugaa gggcuucagc uucagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

accgagaccg acagcagcuu cagcaugaag caggacauca ucgcccugac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gcaugaacug caucagaccc 1260

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agcagcauca gcuucugcgg cgugaacagc ggcaccgcca gcuggagcug gcccgacggc 1380

gccgaccugc ccuucaccau cgacaaguga 1410

<210> 176854
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<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR01015

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR08422

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176856
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR08432

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176857
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR08442

<400> 176857
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176858
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR08452

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176859
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176860
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR08565

<400> 176860
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugcccguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176861
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR08566

<400> 176861
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176862
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<220>
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neuraminidase__InfluenzaA__ACR08567

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 176863
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neuraminidase__InfluenzaA__ACR08568

<400> 176863
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176864
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neuraminidase__InfluenzaA__ACR08569

<400> 176864
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176865
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176867
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<400> 176867
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176868
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR08573

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176869
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<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176870
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<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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<210> 176871
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<212> RNA
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neuraminidase__InfluenzaA__ACR08577

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176872
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neuraminidase__InfluenzaA__ACR09378

<400> 176872
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176873
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR09379

<400> 176873
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176874
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR09380

<400> 176874
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176875
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR09381

<400> 176875
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176876
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR09382

<400> 176876
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176877
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR09383

<400> 176877
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176878
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR09384

<400> 176878
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176879
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR09385

<400> 176879
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176880
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR09386

<400> 176880
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176881
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

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<400> 176881

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176882

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR10226

<400> 176882
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176883
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR10236

<400> 176883
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176884
<211> 1410
<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176885
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR15186

<400> 176885
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaagug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau gaaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR15197

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176887
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR15208

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR15230

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR15241

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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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<210> 176890
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<212> RNA
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neuraminidase__InfluenzaA__ACR15252

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176891
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176891

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176892
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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<400> 176892
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176893
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR15307

<400> 176893
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacaacacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176894
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR15318

<400> 176894
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

agacagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176895
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR15329

<400> 176895
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

agaagccaga accacaccgg cgugugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugaucgccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccaaggaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176896
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR15340

<400> 176896
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176897
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR15362

<400> 176897
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176898
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR15373

<400> 176898
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176899
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR15428

<400> 176899
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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagcg ugagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugaccaaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176900
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR15472

<400> 176900
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

acccccguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucgccu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagguga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR15483

<400> 176901
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176902
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR15505

<400> 176902
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176903
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR15516

<400> 176903
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 176904
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR15527

<400> 176904
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176905
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR15538

<400> 176905
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176906
<211> 1410
<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176907
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR15560

<400> 176907
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 176908
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR15582

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR15593

<400> 176909
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caggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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<210> 176914
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<212> RNA

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

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aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176917
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neuraminidase__InfluenzaA__ACR18929

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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<210> 176918
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neuraminidase__InfluenzaA__ACR18930

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

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gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

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uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176919
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR18931

<400> 176919
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176920
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR18933

<400> 176920
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176921
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR18934

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176922
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<212> RNA
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neuraminidase__InfluenzaA__ACR18935

<400> 176922
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176923
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR23301

<400> 176923
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176924
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR32997

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176926
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176927
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176928
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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<212> RNA
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176930
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR39357

<400> 176930
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176931
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR39396

<400> 176931
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176932
<211> 1410
<212> RNA
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<220>
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<400> 176932
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176933
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR39416

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR39426

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176936

<211> 1410
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<400> 176936
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176937
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR39456

<400> 176937
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176938
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR39466

<400> 176938
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176939
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR39476

<400> 176939
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176940
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR39486

<400> 176940
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176941
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR39496

<400> 176941
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176942
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR40291

<400> 176942
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176943
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR40301

<400> 176943
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176944
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR40311

<400> 176944
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaccga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176945
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR40321

<400> 176945

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176946
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR40341

<400> 176946
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176947
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR40351

<400> 176947
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176948
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR40361

<400> 176948
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176949
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR40371

<400> 176949
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176950
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR40391

<400> 176950
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176951
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR46663

<400> 176951
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176952
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR46673

<400> 176952
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176953
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR46996

<400> 176953
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176954
<211> 1410
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR46997

<400> 176954
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176955
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR46998

<400> 176955
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176956
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR46999

<400> 176956
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176957
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR47000

<400> 176957
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176958
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR47001

<400> 176958
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176959
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR47002

<400> 176959
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176960
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR47003

<400> 176960
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176961
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR47008

<400> 176961
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aaccugaucc ugcagaucgg caacaucauc agcaucuggc ccgugcacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176962
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR49267

<400> 176962
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176963
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR49268

<400> 176963
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176964
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR49269

<400> 176964
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176965
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR49270

<400> 176965
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176966
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR49271

<400> 176966
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176967
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR49272

<400> 176967
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176968
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR49273

<400> 176968
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176969
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR49274

<400> 176969
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176970
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR49275

<400> 176970
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176971
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR49277

<400> 176971
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176972
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR49278

<400> 176972
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176973
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR49279

<400> 176973
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176974
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR50994

<400> 176974
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176975
<211> 1410
<212> RNA
<213> Artificial Sequence

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neuraminidase__InfluenzaA__ACR50998

<400> 176975
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176976
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR51008

<400> 176976
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176977
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR51018

<400> 176977
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176978
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ACR51028

<400> 176978
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176979
<211> 1410

<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR51038

<400> 176979
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176980
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR51048

<400> 176980
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176981
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR51058

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 176982
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR51068

<400> 176982
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176983
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<220>
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neuraminidase__InfluenzaA__ACR52371

<400> 176983
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176984
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR52381

<400> 176984
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176985
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR52391

<400> 176985
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176986
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR52401

<400> 176986
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176987
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR52411

<400> 176987
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176988
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR52421

<400> 176988
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176989
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<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR52431

<400> 176989

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176990

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 176991
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176993
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<212> RNA
<213> Artificial Sequence

<220>
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<400> 176993
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176994
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<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176995
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176996
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR54052

<400> 176996
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176997
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR54966

<400> 176997
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176998
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 176999
<211> 1410
<212> RNA
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<220>
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<400> 176999

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177000
<211> 1410
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR54996

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177001
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neuraminidase__InfluenzaA__ACR55006

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177002
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR56383

<400> 177002
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177003
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR56393

<400> 177003
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177004
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR56403

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177005
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR56413

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177006
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR56423

<400> 177006
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177007
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR56433

<400> 177007
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177008
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR56443

<400> 177008
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177009
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR56453

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177010
<211> 1413
<212> RNA
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neuraminidase__InfluenzaA__ACR58555

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177011
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR61658

<400> 177011
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gagcaucaac aacaccaacg uggugaccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcaagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accgacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcguggac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177012
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR61680

<400> 177012
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caucguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177013
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR61691

<400> 177013
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccacaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177014
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR61702

<400> 177014
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagcaacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177015
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR67201

<400> 177015
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177016
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACR67202

<400> 177016
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177017
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR67203

<400> 177017
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177018
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR67204

<400> 177018
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177019
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACR67246

<400> 177019
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177020
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<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177021
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177021
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177022
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACR77461

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177023
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<220>
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neuraminidase__InfluenzaA__ACR77471

<400> 177023
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177024
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<220>
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neuraminidase__InfluenzaA__ACR77481

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177025
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<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177026
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR77501

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177027
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACR83527

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177028
<211> 1410
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neuraminidase__InfluenzaA__ACR83539

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177029
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<212> RNA
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ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177032
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<400> 177033
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<400> 177034
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

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agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<212> RNA
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neuraminidase__InfluenzaA__ACS27192

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<220>
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neuraminidase__InfluenzaA__ACS27202

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ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177039
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<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177040
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS27222

<400> 177040
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177041
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS27232

<400> 177041
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177042
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS27242

<400> 177042
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177043
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACS27252

<400> 177043

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177044

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACS27771

<400> 177044
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177045
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS34969

<400> 177045
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177046
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACS34970

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177047
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS34971

<400> 177047
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177048
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACS34972

<400> 177048
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177049
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<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177050
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS50087

<400> 177050
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177051
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACS50094

<400> 177051
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177052
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACS54264

<400> 177052
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<400> 177053

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177057
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<212> RNA
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177058
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neuraminidase__InfluenzaA__ACS68823

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177059
<211> 1410
<212> RNA
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<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS75824

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177060
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neuraminidase__InfluenzaA__ACS77929

<400> 177060
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177061
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACS77939

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177062
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACS77949

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177064
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACS77969

<400> 177064
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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neuraminidase__InfluenzaA__ACS77979

<400> 177065
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS77989

<400> 177066
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177067
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS77999

<400> 177067
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177068
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS78009

<400> 177068
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177069
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS78019

<400> 177069
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177070
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACS78039

<400> 177070
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177071
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS78049

<400> 177071
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177072
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS88274

<400> 177072
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177073
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS88275

<400> 177073
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177074
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS92572

<400> 177074
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177075
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACS92582

<400> 177075
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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<213> Artificial Sequence

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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<210> 177078
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<212> RNA
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<400> 177078
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

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<400> 177079
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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<210> 177080
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<212> RNA
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<400> 177080
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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<210> 177081
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

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<210> 177082
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

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<210> 177083
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<212> RNA
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<400> 177083
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gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

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uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

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ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

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<210> 177084
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<212> RNA
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neuraminidase__InfluenzaA__ACT15315

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ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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neuraminidase__InfluenzaA__ACT15319

<400> 177085
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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<210> 177086
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACT15321

<400> 177086
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gagagccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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<210> 177087
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACT15323

<400> 177087

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 177088
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ACT15325

<400> 177088
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACT15327

<400> 177089
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaacagau gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 177090

<211> 1350
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACT15331

<400> 177090
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

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<400> 177091
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccagggcga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

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gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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neuraminidase__InfluenzaA__ACT15335

<400> 177092
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaacagau gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT15337

<400> 177093
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

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gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

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<210> 177094
<211> 1350
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT15341

<400> 177094
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

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accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 177095
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT15344

<400> 177095
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

agcaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

ugcuaccccg acgccggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 840

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cguguucccc 960

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 177096
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT15346

<400> 177096
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acaacaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cguguucccc 960

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

agcagcauca gcuucugcgg cgugaacggc gacaccguga gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 177097
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT15348

<400> 177097
augaacccca accagaagau caucaccauc ggcagcaucu gcauggugau cggcaccgug 60

agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccagggcga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cguggugagc 960

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agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1080

accggcaccg acagcagcuu cagcggcaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 177098
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT15350

<400> 177098
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaacagau gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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aucuucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cguguucccc 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

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accggcaccg acagcagcuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gaaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 177099
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT15352

<400> 177099
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cguggugagc 960

aacggcgccu acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1020

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accggcaccg acagcagcuu cagcggcaag caggacaucg uggccaucac cgacuggagc 1140

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1200

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 177100
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT15354

<400> 177100
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agccugaugc ugcagaucgg caacaugauc agcaucugga ucagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 177101
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT15356

<400> 177101
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 177102
<211> 1350
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT15358

<400> 177102
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaacagau gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccacgg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 177103
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT21515

<400> 177103
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 177104
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACT21516

<400> 177104
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgccua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgagaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga acgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177105
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT21517

<400> 177105

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcgagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccuggugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177106

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT21574

<400> 177106
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177107
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT21585

<400> 177107
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177108
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT22011

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177109
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT22012

<400> 177109
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177110
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT22013

<400> 177110
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177111
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT22014

<400> 177111
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177112
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACT22015

<400> 177112
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177113
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT22016

<400> 177113
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177114
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT22017

<400> 177114
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177115
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT22018

<400> 177115

augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177116
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT22506

<400> 177116
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177117
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT22511

<400> 177117
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177118
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT33121

<400> 177118
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177119
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT33124

<400> 177119
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177120
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT33126

<400> 177120
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177121
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT35526

<400> 177121
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177122
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT36507

<400> 177122
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177123
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT36672

<400> 177123
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177124
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT36673

<400> 177124
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177125
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT36674

<400> 177125
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177126
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT36675

<400> 177126
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177127
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT36677

<400> 177127
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177128
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACT36678

<400> 177128
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccag acagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177129
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT36679

<400> 177129
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177130
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT36680

<400> 177130
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177131
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT36682

<400> 177131
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177132
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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neuraminidase__InfluenzaA__ACT36684

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<212> RNA
<213> Artificial Sequence

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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gccgagcugc ccuucaccau cgacaaguga 1410

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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neuraminidase__InfluenzaA__ACT36695

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ACT52684

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agauccugag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ACT67117

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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neuraminidase__InfluenzaA__ACT67121

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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neuraminidase__InfluenzaA__ACT67240

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT67241

<400> 177150
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177151
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT67243

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177152
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT67256

<400> 177152
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177153
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT68161

<400> 177153
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aaggccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177154
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT68162

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<211> 1410
<212> RNA
<213> Artificial Sequence

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neuraminidase__InfluenzaA__ACT68163

<400> 177155
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ACT68164

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ACT68166

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177158
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT68167

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177159
<211> 1410
<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT68168

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177160

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT68169

<400> 177160
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcgaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacga gaccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucag cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177161
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT68171

<400> 177161
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177162
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT68172

<400> 177162
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177163
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT68173

<400> 177163
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177164
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT68174

<400> 177164
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177165
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT68175

<400> 177165
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177166
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT68176

<400> 177166
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177167
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT68177

<400> 177167
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177168
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT68178

<400> 177168
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177169
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT68179

<400> 177169

augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177170
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT68180

<400> 177170
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177171
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT79145

<400> 177171
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177172
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT79155

<400> 177172
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccugcu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177173
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT79165

<400> 177173
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177174
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT79175

<400> 177174
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177175
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT79185

<400> 177175
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177176
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT79622

<400> 177176
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177177
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT79630

<400> 177177
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177178
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<220>
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neuraminidase__InfluenzaA__ACT83798

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177179
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACT83808

<400> 177179
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177180
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT83818

<400> 177180
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177181
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACT83828

<400> 177181
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177182
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACT83838

<400> 177182
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177183
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACT83848

<400> 177183
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177184
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177185
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT83868

<400> 177185
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177186
<211> 1410
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neuraminidase__InfluenzaA__ACT83878

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177187
<211> 1410
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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT86002

<400> 177187
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177188
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT86012

<400> 177188
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177189
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT86022

<400> 177189
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177190
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT86032

<400> 177190
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177191
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT86042

<400> 177191
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177192
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT86052

<400> 177192
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177193
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT86062

<400> 177193
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177194
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT86072

<400> 177194
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177195
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT86082

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177196
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT86092

<400> 177196
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177197
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT86102

<400> 177197
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177198
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT86112

<400> 177198
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177199
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACT86122

<400> 177199
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177200
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT86132

<400> 177200
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177201
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACT86142

<400> 177201
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177202
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ACT97323

<400> 177202
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177203
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU00934

<400> 177203
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177204
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU00944

<400> 177204
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177205
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACU00954

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177206
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU12497

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcaaca gcccccccaa caaccaggug augcccugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agagagagau cugccccaag 240

cugguggagu acagaaacug gagcaagccc cagugcagag ugaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacagac acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcca cgacgagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucgugag cuggagcaag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cgagagagcc gacaccaaga uccuguucau cgaggagggc 780

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177207
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU12508

<400> 177207
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177208
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU12519

<400> 177208
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacgagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cccaucgugg acaucaacau caaggacuac agcaucguga gcagcuacgu gugcagcggc 960

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ugcuucuacg uggagcugau cagaggcaga aaccaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177209
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU12530

<400> 177209
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcaa cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177210
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU12541

<400> 177210
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177211
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU12552

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177212
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU12574

<400> 177212
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aaccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177213
<211> 1413
<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACU12585

<400> 177213

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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177214

<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU12596

<400> 177214
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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

aagagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

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<210> 177215
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neuraminidase__InfluenzaA__ACU13077

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177216
<211> 1410
<212> RNA
<213> Artificial Sequence

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<400> 177216
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177217
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU13079

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177218
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU13080

<400> 177218
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177219
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<212> RNA
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neuraminidase__InfluenzaA__ACU13081

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177220
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<212> RNA
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neuraminidase__InfluenzaA__ACU13082

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177221
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neuraminidase__InfluenzaA__ACU13083

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177222
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<400> 177223

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACU16861

<400> 177224
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177225
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU16934

<400> 177225
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177226
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU16997

<400> 177226
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177227
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACU17130

<400> 177227
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177228
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU17191

<400> 177228
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177229
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU17262

<400> 177229
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga gccagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177230
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU17325

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177231
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU17393

<400> 177231
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177232
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU17454

<400> 177232
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177233
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU17524

<400> 177233
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177234
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177235
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACU27415

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga ccuucgccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177236
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU27416

<400> 177236
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga ccuucgccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177237
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU29961

<400> 177237
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177238
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU29971

<400> 177238
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gagcgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177239
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU29981

<400> 177239
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177240
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177241
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU30001

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<220>
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neuraminidase__InfluenzaA__ACU30021

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177243
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU30085

<400> 177243
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugauggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU30095

<400> 177244
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177245
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<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177246
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU30114

<400> 177246
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177247
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU30123

<400> 177247
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177248
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU31177

<400> 177248
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccaccu gauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucagcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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neuraminidase__InfluenzaA__ACU31178

<400> 177249
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177251
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neuraminidase__InfluenzaA__ACU31180

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ACU31181

<400> 177252
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU31182

<400> 177253
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<212> RNA
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neuraminidase__InfluenzaA__ACU31183

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177255
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<212> RNA
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<400> 177255
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177256
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU31185

<400> 177256
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177257
<211> 1410

<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU31186

<400> 177257
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177258
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU31187

<400> 177258
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177259
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177260
<211> 1350
<212> RNA
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neuraminidase__InfluenzaA__ACU46645

<400> 177260
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ggcaaccagc acaaggccga gcccaucagc aacaccaacc ugcugaccga gaagaccgug 180

gccagcguga agcuggccgg caacagcagc cugugcccca ucaacggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ggccccgugg gcgaggcccc cagccccuac aacagcagau ucgaguacgu ggccuggagc 480

gccagcgccu gccacgacag aaccagcaga cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag caacggccag gccagccaca agaucuucaa gauggagaag 720

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1320

gccgagcugc ccuucaccau cgacaaguga 1350

<210> 177261
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU56927

<400> 177261
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgacaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177262
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177262
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177263
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU64791

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177264
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU64811

<400> 177264
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcaug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucaucau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177265
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU79885

<400> 177265
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcauc ugcagagaca acuggaaggg cagcaacaga 900

cccguggugg acaucaacau ggaggacuac agcaucgaca gcagcuacgu gugcagcggc 960

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcacaucuga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU79896

<400> 177266
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

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<212> RNA
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<220>
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

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gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccacgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

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<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU79929

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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccaag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 177269
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU79940

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177270
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU79951

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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcgagaaga gccaccccaa ggugugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaaca ucgccgccgg ccagggcgug 240

acccccauca uccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgaca ucuucgugau gagagagccc 360

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

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ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

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cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

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accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

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aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

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cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177280
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU80094

<400> 177280
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177281
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU80105

<400> 177281
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177282
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177283
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU80138

<400> 177283
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177284
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU80160

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177285
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU80171

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177286
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80182

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177287
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80193

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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU80204

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177289
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<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACU80237

<400> 177289

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcaaccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177290

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU80248

<400> 177290
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177291
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80259

<400> 177291
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177292
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACU80270

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccagcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177293
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80281

<400> 177293
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177294
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80303

<400> 177294
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcaa cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU80314

<400> 177295
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80325

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU80336

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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neuraminidase__InfluenzaA__ACU80347

<400> 177298
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177299
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177299

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177300
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177300
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177301
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80380

<400> 177301
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177302
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80391

<400> 177302
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaucaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177303
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACU80402

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177304
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU80413

<400> 177304
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177305
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80427

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177306
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80438

<400> 177306
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177307
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80461

<400> 177307
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177308
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU80603

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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<210> 177309
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU80614

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177310
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACU80625

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177311
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACU80636

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177312
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80647

<400> 177312
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcgacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177313
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80658

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaagau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
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<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACU80669

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACU80691

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 177316
<211> 1410
<212> RNA
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<220>
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gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gaguucaaca gcagccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177319
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<212> RNA
<213> Artificial Sequence

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ACU80746

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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neuraminidase__InfluenzaA__ACU80757

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agguggugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACU80768

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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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neuraminidase__InfluenzaA__ACU81106

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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ggcaacagca gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177327
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU87265

<400> 177327
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACU87273

<400> 177328
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177329
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04231

<400> 177329
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177330
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04241

<400> 177330
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177331
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04251

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177332
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ACV04261

<400> 177332
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177333
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04271

<400> 177333
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177334
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV04281

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucggc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177335
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177336
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04301

<400> 177336
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177337
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04321

<400> 177337
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177338
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04331

<400> 177338
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177339
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04341

<400> 177339
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177340
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV04351

<400> 177340
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177341
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04361

<400> 177341
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177342
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04371

<400> 177342
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177343
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV04381

<400> 177343

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177344

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04391

<400> 177344
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<220>
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neuraminidase__InfluenzaA__ACV04401

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177346
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV04411

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177347
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV04492

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177348
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04502

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177349
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV04512

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177350
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04522

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg caagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177351
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04532

<400> 177351
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177352
<211> 1410
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177353
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177354
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04572

<400> 177355
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177356
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV04582

<400> 177356
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177357
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV04758

<400> 177357
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccccag cgagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177358
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV33087

<400> 177358
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177359
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV33107

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177360
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV33117

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177361
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV33127

<400> 177361
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177362
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV33137

<400> 177362
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177363
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV33147

<400> 177363
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177364
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV33157

<400> 177364
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccgugg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177365
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177365
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg acuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177366
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV33177

<400> 177366
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177367
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV41993

<400> 177367
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaucugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177368
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV42010

<400> 177368
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177369
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<212> RNA
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neuraminidase__InfluenzaA__ACV42020

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177370
<211> 1410
<212> RNA
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<220>
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gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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gacaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcacaucuga 1410

<210> 177371
<211> 1362
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV49537

<400> 177371
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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

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ugggccaucc acagcaagga caacggcauc agaaucggca gcaagggcga cguguucgug 300

aucagagagc ccuucaucag cugcagccac cuggagugca gaaccuucuu ccugacccag 360

ggcgcccugc ugaacgacaa gcacagcaac ggcgccguga aggacagaag ccccuacaga 420

gcccugauga gcugccccgu gggcgaggcc cccagccccu acaacagcag auucgagagc 480

guggccugga gcgccagcgc cugccacgac ggcaugggcu ggcugaccau cggcaucagc 540

ggccccgaca acggcgccgu ggccgugcug aaguacaacg gcaucaucac cgagaccauc 600

aagagcugga gaaagaagau ccugagaacc caggagagcg agugcaccug cgugaacggc 660

agcugcuuca ccaucaugac cgacggcccc agcgacggcc uggccagcua caagaucuuc 720

aagaucgaga agggcaaggu gaccaagagc aucgagcuga acgcccccaa cagccacuac 780

gaggagugca gcugcuaccc cgacaccggc aaggugaugu gcgugugcag agacaacugg 840

cacggcagca acagacccug ggugagcuuc gaccagaacc uggacuacca gaucggcuac 900

aucugcagcg gcguguucgg cgacaacccc agacccaagg acggcaccgg cagcugcggc 960

cccgugagcg ccgacggcgc caacggcgug aagggcuuca gcuacagaua cggcaacggc 1020

guguggaucg gcagaaccaa gagcgacagc agcagacacg gcuucgagau gaucugggac 1080

cccaacggcu ggaccgagac cgacagcaga uucagcguga gacaggacgu gguggccaug 1140

accgacagaa gcggcuacag cggcagcuuc gugcagcacc ccgagcugac cggccuggac 1200

ugcaugagac ccugcuucug gguggagcug aucagaggca gacccgagga gaagaccauc 1260

uggaccagcg gcagcaucau cagcuucugc ggcgugaaca gcgacaccgu ggacuggagc 1320

uggcccgacg gcgccgagcu gcccuucacc aucgacaagu ga 1362

<210> 177372
<211> 1362
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV49559

<400> 177372
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guggccugga gcgccagcgc cugccacgac ggcaugggcu ggcugaccau cggcaucagc 540

ggccccgaca acggcgccgu ggccgugcug aaguacaacg gcaucaucac cgagaccauc 600

aagagcugga gaaagaagau ccugagaacc caggagagcg agugcgccug cgugaacggc 660

agcugcuuca ccaucaugac cgacggcccc agcgacggcc ccgccagcua caagaucuuc 720

aagaucgaga agggcaaggu gaccaagagc aucgagcugg acgcccccaa cagccacuac 780

gaggagugca gcugcuaccc cgacaccggc aaggugaugu gcgugugcag agacaacugg 840

cacggcagca acagacccug ggugagcuuc gaccagaacc uggacuacca gaucggcuac 900

aucugcagcg gcguguucgg cgacaccccc agacccaagg acggcaccgg cagcugcggc 960

cccgugagcg uggacggcgc caacggcgug aagggcuuca gcuacagaua cggcgacggc 1020

guguggaucg gcagaaccaa gagccagagc agcagacacg gcuucgagau gaucugggac 1080

cccaacggcu ggaccgagac cgacagcaga uucagcguga gacaggacgu gguggccauc 1140

accgacugga gcggcuacag cggcagcuuc gugcagcacc ccgagcugac cggccuggac 1200

ugcaugagac ccugcuucug gguggagcug aucagaggcc agcccaagga gaagaccauc 1260

uggaccagcg gcagcagcau cagcuucugc ggcgugaaca gcgacaccgu ggacuggagc 1320

uggcccgacg gcgccgagcu gcccuucacc aucgacaagu ga 1362

<210> 177373
<211> 1395
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV49570

<400> 177373
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agccugaucc ugcagaucgg caacaucgug agcaucugga ucagccacag cauccagacc 120

ggcaaccaga accacaccgg caccugcgac cagagcauca ucaccuacaa gaacagcacc 180

ugggugaacc agaccuacgu gaacguggug gccggcaagg acaccaccag cgugauccug 240

gccggcaaca gcagccugug ccccaucaga ggcugggcca ucuacagcaa ggacaacggc 300

gugagaaucg gcagcaaggg cgacguguuc gugaucagag agcccuucau cagcugcagc 360

caccuggagu gcagaaccuu cuuccugacc cagggcgccc ugcugaacga caagcacagc 420

aacggcaccg ugaaggacag aagccccuac agagcccuga ugagcugccc cgugggcgag 480

gcccccagcc ccuacaacag cagauucgag agcguggccu ggagcgccag cgccugccac 540

gacggcaugg gcuggcugac caucggcauc agcggccccg acgacggcgc cguggccgug 600

cugaaguaca acggcaucau caccgagacc aucaagagcu ggagaaagga gauccugaga 660

acccaggaga gcgagugcgu gugcgugaac ggcagcugcu ucaccaucau gaccgacggc 720

cccagcggcg gccccgccag cuacaagauc uucaagaucg agaagggcaa ggugaccaag 780

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uucgaccaga accuggacua ccagaugggc uacaucugca gcggcguguu cggcgacaac 960

cccagaccca aggacggcaa gggcagcugc ggccccgugu acguggacgg cgccaacggc 1020

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agcagcagac agggcuucga gaugaucugg gaccccaacg gcuggaccga gaccgacagc 1140

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uucgugcagc accccgagcu gaccggccug gacugcauga gacccugcuu cugggguggag 1260

cugaucagag gcagacccaa ggagaacacc aucuggacca gcggcagcag caucagcuuc 1320

ugcggcguga acagcgacac cguggacugg agcuggcccg acggcgccga gcugcccuuc 1380

accaucgaca aguga 1395

<210> 177374
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV49581

<400> 177374
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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accagacagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga cagcaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 177375
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV49592

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ugcuuccuga ugcagaucgc cauccuggug accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacga caccauccac gacagaaucc cccacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau cgaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 177376
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ACV49603

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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

gacaacaagc acagcaacgg caccauccac gacagaaucc cccacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcguggc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacagaaac 600

gccaccgcca gcuucaucua cgacggcaga cugguggaca gcaucggcag cuggagccag 660

aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcagagcc gacaccagaa uccuguucau caaggagggc 780

aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga ccccaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 177377
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV49625

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ugcuuccuga ugcagaucgc cauccuggcc accaccguga cccugcacuu caagcagcac 120

gagugcgaca gccccgccag caaccaggug augcccugcg agcccaucau caucgagaga 180

aacaucaccg agaucgugua ccugaacaac accaccaucg agaaggagau cugccccgag 240

gugguggagu acagaaacug gagcaagccc cagugccaga ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagaggcccc 360

uacgugagcu gcgaccccgg caagugcuac caguucgccc ugggccaggg caccacccug 420

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aacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaucagccc ccugagcggc agcgcccagc acaucgagga gugcagcugc 840

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aacaacugga gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga ccccaggaga ccagagugug guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaacuucau gcccaucuga 1410

<210> 177378
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV49647

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV49669

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agccugaucc ugcagaucgg caacaucgug agcaucugga ucagccacag cauccagacc 120

ggcagccaga acuacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucaac aacaccaacg ugguggccgg ccaggacacc 240

accagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacgac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaga 660

aagagaaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccaa caacggcccc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuucuggg uggagcugau cagaggcaga cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac ggcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177380
<211> 1413
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<220>
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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

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neuraminidase__InfluenzaA__ACV53442

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177382
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<220>
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neuraminidase__InfluenzaA__ACV53452

<400> 177382
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177383
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV53462

<400> 177383
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177384
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV53472

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177385
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV53482

<400> 177385
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accgccaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177386
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV53492

<400> 177386
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aaggccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accgagaccg acaacaacuu ccugaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177387
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV53502

<400> 177387

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aaggccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu ccugaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177388

<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV53891

<400> 177388
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaagaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugcgaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177389
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<220>
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neuraminidase__InfluenzaA__ACV53901

<400> 177389
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagca gaagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177390
<211> 1410
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177391
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV67088

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177392
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV67168

<400> 177392
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV67169

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177394
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV67171

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177395
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV67172

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177396
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177397
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV67174

<400> 177397

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177398
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcagca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177399
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV67176

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177400
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV67177

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177401
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV67178

<400> 177401
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177402
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV67179

<400> 177402
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177403
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV67180

<400> 177403
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagcccgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177404
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV67181

<400> 177404
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucaucau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagauca ucaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177405
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV67182

<400> 177405
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177406
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV67183

<400> 177406
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcaacga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucaacag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177407
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV67184

<400> 177407
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177408
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV67186

<400> 177408
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177409
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV67187

<400> 177409
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177410
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV67188

<400> 177410
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177411
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV67189

<400> 177411
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177412
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV67190

<400> 177412
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177413
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ACV67191

<400> 177413
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177414
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV67192

<400> 177414
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177415
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV67193

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177416
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV67194

<400> 177416
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177417
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV67195

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177418
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV67196

<400> 177418
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177419
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV67197

<400> 177419
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177420
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV67199

<400> 177420
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177421
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV67200

<400> 177421
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177422
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV67201

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177423
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV67202

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177424
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV67203

<400> 177424
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177425
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<220>
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neuraminidase__InfluenzaA__ACV67204

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177426
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV67205

<400> 177426
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177427
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcaug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177428
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV67207

<400> 177428
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177429
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV67208

<400> 177429
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177430
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ACV67210

<400> 177430
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177431
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV67211

<400> 177431
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177432
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70076

<400> 177432
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177433
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70086

<400> 177433
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177434
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70096

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucaccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177435
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV70106

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177436
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70116

<400> 177436
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177437
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70126

<400> 177437
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177438
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70157

<400> 177438
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177439
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70167

<400> 177439
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177440
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70177

<400> 177440
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177441
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70187

<400> 177441

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177442

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70197

<400> 177442
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177443
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70207

<400> 177443
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177444
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70217

<400> 177444
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177445
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70227

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177446
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV70237

<400> 177446
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177447
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70247

<400> 177447
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177448
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70257

<400> 177448
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177449
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70267

<400> 177449
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177450
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70277

<400> 177450
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177451
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70287

<400> 177451

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177452
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70297

<400> 177452
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177453
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70307

<400> 177453
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177454
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70317

<400> 177454
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177455
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70327

<400> 177455
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ACV70337

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177457
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70347

<400> 177457
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177458
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70357

<400> 177458
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177459
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV70367

<400> 177459
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177460
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70377

<400> 177460
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177461
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70387

<400> 177461
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<400> 177462
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177463
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177464
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV70417

<400> 177464
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177465
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70427

<400> 177465
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177466
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70437

<400> 177466
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177467
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70447

<400> 177467
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177468
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70457

<400> 177468
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177469
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70467

<400> 177469
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177470
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70477

<400> 177470
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177471
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70487

<400> 177471
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177472
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV70497

<400> 177472
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177473
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70507

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177474
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70517

<400> 177474
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177475
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70527

<400> 177475
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177476
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70547

<400> 177476
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177477
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70557

<400> 177477
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177478
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70567

<400> 177478
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177479
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70577

<400> 177479
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177480
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70587

<400> 177480
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177481
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177482
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70607

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177483
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ACV70617

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177484
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV70647

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177485
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV70657

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177486
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV70667

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177487
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV70677

<400> 177487
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177488
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70687

<400> 177488
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177489
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV70697

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177490
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV70707

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<220>
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neuraminidase__InfluenzaA__ACV70717

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177493
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70737

<400> 177493
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<220>
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neuraminidase__InfluenzaA__ACV70757

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177495
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70767

<400> 177495

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177496

<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV70777

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177497
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<220>
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neuraminidase__InfluenzaA__ACV70787

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177498
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177499
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177500
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<220>
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neuraminidase__InfluenzaA__ACV70817

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177501
<211> 1410
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177502
<211> 1410
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<220>
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neuraminidase__InfluenzaA__ACV70837

<400> 177502
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177503
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70847

<400> 177503
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaugagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177504
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70867

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177505
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70877

<400> 177505

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177506
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70887

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcaug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177507
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70897

<400> 177507
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177508
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70907

<400> 177508
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177509
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACV70917

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177510
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70927

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177511
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70937

<400> 177511
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177512
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177513
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177514
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV70967

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177515
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV70977

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177516
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV70987

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177517
<211> 1410
<212> RNA
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177518
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<220>
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neuraminidase__InfluenzaA__ACV82218

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177519
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV82219

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177520
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<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV82220

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ugcuucuuca ugcagcuggc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggagaaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177521
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV82221

<400> 177521
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177522
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACV88402

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177523
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV88412

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177524
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV88422

<400> 177524
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177525
<211> 1365
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACV89505

<400> 177525
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agccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagaacauca ucaccuacaa gaacagcacc 180

ugggugaagg acaccaccag cgugauccug accggcaaca gcagccugug ccccaucaga 240

ggcugggcca ucuacagcaa ggacaacagc aucagaaucg gcagcaaggg cgacguguuc 300

gugaucagag agcccuucau cagcugcagc caccuggagu gcagaaccuu cuuccugacc 360

cagggcgccc ugcugaacga caagcacagc agcggcaccg ugaaggacag aagccccuac 420

agagcccuga ugagcugccc cgugggcgag gcccccagcc ccuacaacag cagauucgag 480

agcguggccu ggagcgccag cgccugccac gacggcaugg gcuggcugac caucggcauc 540

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ggcgugugga ucggcagaac caagagccac agcagcagac acggcuucga gaugaucugg 1080

gaccccaacg gcuggaccga gaccgacagc aaguucagcg ugagacagga cgugguggcc 1140

augaccgacu ggagcggcua cagcggcagc uucgugcagc accccgagcu gaccggccug 1200

gacugcauga gacccugcuu cugggugggag cugaucagag gcagacccaa ggagggcacc 1260

aucuggacca gcgccagcag caucagcuuc ugcggcguga acagcgacac cguggacugg 1320

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<210> 177526
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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACV91673

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177527
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177527

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177528
<211> 1410
<212> RNA
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<220>
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gaguucaaca gcccccccaa caaccaggug cugcugugcg agcccgccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 177529
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACX31901

<400> 177529
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177530
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACX31902

<400> 177530
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177531
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177531
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177532
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX31906

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177533
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACX31907

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177534
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACX31908

<400> 177534
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177535
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX31909

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177536
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX31911

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177537
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACX31912

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177538
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACX31913

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177539
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACX31914

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177540
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX31915

<400> 177540
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177541
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX31916

<400> 177541
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177542
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177542
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucacc gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177543
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX31918

<400> 177543
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177544
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177545
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<220>
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neuraminidase__InfluenzaA__ACX31920

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177546
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX31922

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177547
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neuraminidase__InfluenzaA__ACX31923

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177548
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACX31924

<400> 177548
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177549
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACX31925

<400> 177549
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

cugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaucau cgacaaguga 1410

<210> 177550
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX31926

<400> 177550
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177551
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACX31927

<400> 177551
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177552
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX31928

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgaga acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

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<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACX31929

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177554
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<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177555
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACX31931

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177556
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX31932

<400> 177556
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177557
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177558
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX35260

<400> 177558
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177559
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACX35270

<400> 177559
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177560
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ACX35280

<400> 177560
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggacaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177561
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX35290

<400> 177561
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177562
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX35300

<400> 177562
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177563
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACX35310

<400> 177563
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucgg caccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177564
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACX35320

<400> 177564
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177565
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX35330

<400> 177565
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177566
<211> 1410
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177567
<211> 1410
<212> RNA
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<220>
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<400> 177567
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177568
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACX55836

<400> 177568
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177569
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACX56269

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177570
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ACX56270

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177571
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<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACX56271

<400> 177571

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacc uggccgccgg ccagagcgug 240

ggcagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177572

<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACX83579

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177573
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACX85425

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177574
<211> 1410
<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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<210> 177575
<211> 1410
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neuraminidase__InfluenzaA__ACY02998

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177576
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACY03005

<400> 177576
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177577
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACY03008

<400> 177577
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177578
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACY03011

<400> 177578
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177579
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACY03012

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177580
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACY03016

<400> 177580
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177581
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACY26194

<400> 177581

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177582
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACY26204

<400> 177582
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177583
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACY30123

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177584
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACY30124

<400> 177584
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177585
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACY30125

<400> 177585
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177586
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACY30127

<400> 177586
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177587
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACY30128

<400> 177587
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177588
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACY46105

<400> 177588
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177589
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACY46165

<400> 177589
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177590
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACY46175

<400> 177590
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177591
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<220>
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neuraminidase__InfluenzaA__ACY46345

<400> 177591
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177592
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACY46385

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177593
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACY46485

<400> 177593
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177594
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<212> RNA
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<220>
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<400> 177594
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177595
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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<400> 177595
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177596
<211> 1410
<212> RNA
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<220>
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<400> 177596
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177597
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<212> RNA
<213> Artificial Sequence

<220>
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<400> 177597
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccagcgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177598
<211> 1410
<212> RNA
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<220>
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<400> 177598
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177599
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<220>
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neuraminidase__InfluenzaA__ACY77595

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177602
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcuuc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177603
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ACY77665

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177604
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<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACY77675

<400> 177604
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177605
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACY77685

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177606
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACY77695

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177607
<211> 1410
<212> RNA
<213> Artificial Sequence

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neuraminidase__InfluenzaA__ACY77705

<400> 177607
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177608
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACY77725

<400> 177608
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<400> 177609
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177610
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177611
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<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177612
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ACY77775

<400> 177612
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177613
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177614
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACY77795

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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<210> 177615
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACY77825

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcgcca agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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<210> 177616
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACY77835

<400> 177616
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcgcca agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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<210> 177617
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177618
<211> 1410
<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177619
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacc uggccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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<210> 177620
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177622
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177624
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACY77927

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccaacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177625
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<212> RNA
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<400> 177625

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177626

<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACY77947

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177627
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACY77967

<400> 177627
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177628
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177629
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177630
<211> 1410
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga cccuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177631
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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACY78017

<400> 177631
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177632
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ01955

<400> 177632
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccggcaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177633
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05053

<400> 177633
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177634
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ05064

<400> 177634
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177635
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ05074

<400> 177635

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177636
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ05084

<400> 177636
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177637
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05094

<400> 177637
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177638
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05104

<400> 177638
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177639
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ05114

<400> 177639
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177640
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05124

<400> 177640
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177641
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ05144

<400> 177641
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177642
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05154

<400> 177642
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177643
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ05164

<400> 177643
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177644
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05175

<400> 177644
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177645
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05197

<400> 177645
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177646
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05208

<400> 177646
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177647
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05219

<400> 177647
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcggca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177648
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05230

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05241

<400> 177649
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177650
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ05296

<400> 177650
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cguggccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177651
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05307

<400> 177651
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177652
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ05318

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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcagugc 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177653
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05329

<400> 177653
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177654
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05340

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177655
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05362

<400> 177655
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcaa gcugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177656
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05373

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ACZ05395

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<212> RNA

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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05406

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177659
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ05450

<400> 177659
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agccugaugc ugcagaucgg cagcaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177660
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ05461

<400> 177660
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177661
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05472

<400> 177661
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177662
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05483

<400> 177662
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccgugg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

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augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177663
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05494

<400> 177663
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177664
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ05516

<400> 177664
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcagugc 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177665
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177666
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<220>
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neuraminidase__InfluenzaA__ACZ05538

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 177667
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ05593

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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177668
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ACZ05604

<400> 177668
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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagaggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177669
<211> 1410

<212> RNA
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<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177670
<211> 1410
<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 177671
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<212> RNA
<213> Artificial Sequence

<220>
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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 177672
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<220>
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neuraminidase__InfluenzaA__ACZ06008

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

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cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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neuraminidase__InfluenzaA__ACZ16015

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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<211> 1413
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neuraminidase__InfluenzaA__ACZ16025

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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16035

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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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<211> 1410
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<220>
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ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acaacaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177678
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16053

<400> 177678
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177679
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

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<400> 177679

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177680

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16083

<400> 177680
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccag acagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu gggcugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucugga ucgagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177681
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16093

<400> 177681
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177682
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ16103

<400> 177682
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177683
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16113

<400> 177683
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177684
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16123

<400> 177684
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177685
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16133

<400> 177685
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177686
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16143

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc ccugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177687
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16153

<400> 177687
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177688
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177688
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177689
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ16173

<400> 177689

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177690
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ16193

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177691
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16203

<400> 177691
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177692
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16213

<400> 177692
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177693
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacga gaccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ACZ16233

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177695
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neuraminidase__InfluenzaA__ACZ16243

<400> 177695
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcaug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177696
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neuraminidase__InfluenzaA__ACZ16253

<400> 177696
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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neuraminidase__InfluenzaA__ACZ16263

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177699
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16303

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177701
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<220>
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neuraminidase__InfluenzaA__ACZ16313

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177702
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neuraminidase__InfluenzaA__ACZ16323

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcaug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ACZ16353

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177706
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177707
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16373

<400> 177707
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177708
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16383

<400> 177708
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177709
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16393

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177710
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16403

<400> 177710
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177711
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177712
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<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16433

<400> 177712
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177713
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16443

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177714
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16453

<400> 177714
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177715
<211> 1410
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcaug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177716
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16483

<400> 177716
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177717
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16493

<400> 177717
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177718
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16503

<400> 177718
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagauggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177719
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcaug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177720
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16523

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177721
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16533

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177722
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16543

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177723
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16553

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177724
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16586

<400> 177724
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177725
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177725
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177726
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16606

<400> 177726
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177727
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16633

<400> 177727
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177728
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16643

<400> 177728
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugag auacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177729
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16653

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177730
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16663

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177731
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16673

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177732
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16683

<400> 177732
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177733
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<220>

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<400> 177733

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177734

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16703

<400> 177734
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177735
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16713

<400> 177735
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177736
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177736
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177737
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16733

<400> 177737
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177738
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16743

<400> 177738
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177739
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16753

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177740
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<220>
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neuraminidase__InfluenzaA__ACZ16763

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177741
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<220>
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neuraminidase__InfluenzaA__ACZ16773

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177742
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16783

<400> 177742
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177743
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ16793

<400> 177743

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177744
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177744
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177745
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16813

<400> 177745
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177746
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16823

<400> 177746
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177747
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ16833

<400> 177747
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177748
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16843

<400> 177748
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177749
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ16853

<400> 177749
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagauggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177750
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16863

<400> 177750
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177751
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ16873

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177752
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16883

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16893

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177754
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ16903

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177755
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<212> RNA
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neuraminidase__InfluenzaA__ACZ16913

<400> 177755
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177756
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16923

<400> 177756
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177757
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16933

<400> 177757
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177758
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177759
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ16953

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177760
<211> 1410
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177761
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16973

<400> 177761
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177762
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16983

<400> 177762
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177763
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ16993

<400> 177763
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177764
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<212> RNA
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neuraminidase__InfluenzaA__ACZ17003

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177765
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<220>
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neuraminidase__InfluenzaA__ACZ17023

<400> 177765
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177766
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<220>
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neuraminidase__InfluenzaA__ACZ17043

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177767
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ17053

<400> 177767
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177768
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ17063

<400> 177768
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcgaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177769
<211> 1410
<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177770
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neuraminidase__InfluenzaA__ACZ17083

<400> 177770
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcaug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177771
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ17093

<400> 177771
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccccuu cgagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177772
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ17113

<400> 177772
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugaacggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177773
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177773
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177774
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ17133

<400> 177774
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177775
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ17163

<400> 177775
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa cagaaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177776
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ17173

<400> 177776
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa cagaaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177777
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<212> RNA
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neuraminidase__InfluenzaA__ACZ17183

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa cagaaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177778
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neuraminidase__InfluenzaA__ACZ17193

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa cagaaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

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<213> Artificial Sequence

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<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ17203

<400> 177779
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa cagaaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177780
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ17213

<400> 177780
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177781
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ17223

<400> 177781
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177782
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ17233

<400> 177782
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177783
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ17243

<400> 177783
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177784
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ17263

<400> 177784
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177785
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ17273

<400> 177785
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg cuucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugcugagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177786
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ17283

<400> 177786
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177787
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ17293

<400> 177787

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177788

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ17303

<400> 177788
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177789
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ17313

<400> 177789
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177790
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 177790
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177791
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ17411

<400> 177791
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177792
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ17421

<400> 177792
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177793
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ17431

<400> 177793
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucaacag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177794
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ17441

<400> 177794
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucaacag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177795
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<220>
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neuraminidase__InfluenzaA__ACZ17451

<400> 177795
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177796
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177797
<211> 1410
<212> RNA
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<220>
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<400> 177797

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177798
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<220>
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neuraminidase__InfluenzaA__ACZ17491

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177800
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ27803

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcaug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucaucau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177801
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177802
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ27823

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177803
<211> 1410
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177804
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<212> RNA
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neuraminidase__InfluenzaA__ACZ45022

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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neuraminidase__InfluenzaA__ACZ53958

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucggcag cuggagcaag 660

aagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aagaucgugc acaccagcag ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cugccccgac 1380

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aagcaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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gagugcaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aaccugacca agaucgugua ccugaccaac accaccauca agaaggagau cugccccaag 240

cagcccaagu acagaaacug gagcaagccc aagugcaaga ucaccgagcu ggcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacggcc acagcaacga caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177809
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177810
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177811
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ81543

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacaacacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

gagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177812
<211> 1410
<212> RNA
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<220>
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcag cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugcac gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

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<210> 177814
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ81634

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177815
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<220>
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neuraminidase__InfluenzaA__ACZ81644

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177816
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<212> RNA
<213> Artificial Sequence

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<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ81653

<400> 177816
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177817
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ95840

<400> 177817
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177818
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ95850

<400> 177818
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177819
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ95860

<400> 177819
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177820
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ95870

<400> 177820
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177821
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ95880

<400> 177821
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177822
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ95890

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177823
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ95900

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177824
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ95910

<400> 177824
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177825
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ95920

<400> 177825
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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<210> 177826
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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<210> 177827
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<212> RNA
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177828
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177829
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<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177830
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ACZ95970

<400> 177830
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177831
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<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177835
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ96020

<400> 177835
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aaccugaucc ugcagaucgg caacaucauc cugaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaccga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaucgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177836
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ96050

<400> 177836
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177837
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96060

<400> 177837
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177838
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96072

<400> 177838
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177839
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96082

<400> 177839
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177840
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96092

<400> 177840
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177841
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ96102

<400> 177841

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177842

<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ96112

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177843
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ACZ96122

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ggcaaccaga accagaucga ggccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaagg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg caucaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177844
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ96132

<400> 177844
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177845
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96142

<400> 177845
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177846
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96152

<400> 177846
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177847
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96162

<400> 177847
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177848
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96172

<400> 177848
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177849
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96182

<400> 177849
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacagac acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177850
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ96192

<400> 177850
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag aagcaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177851
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96232

<400> 177851

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177852
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ96242

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177853
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<220>
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neuraminidase__InfluenzaA__ACZ96252

<400> 177853
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177854
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ96292

<400> 177854
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177855
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ96302

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177856
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ96312

<400> 177856
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177857
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ96322

<400> 177857
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugaccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177858
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ96332

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugaccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177859
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<220>
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neuraminidase__InfluenzaA__ACZ96352

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177860
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<220>
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neuraminidase__InfluenzaA__ACZ96362

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugaccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177861
<211> 1410
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177862
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugaccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177863
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<212> RNA
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ggcaaccaga accagaccga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaucgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177864
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<212> RNA
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<220>
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<400> 177864
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177867
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<212> RNA
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neuraminidase__InfluenzaA__ACZ96448

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177868
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

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gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177871
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

uggaucaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177872
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<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177873
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177874
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ96552

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cagccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177875
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ96562

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177876
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ96572

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177877
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177878
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag agcagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177880
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcgugg ugaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177881
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ96622

<400> 177881
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177882
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ96632

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177883
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ96642

<400> 177883
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177884
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ96652

<400> 177884
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177885
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96662

<400> 177885
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96672

<400> 177886
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177887
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177888
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96692

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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neuraminidase__InfluenzaA__ACZ96702

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177890
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177891
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ96722

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177892
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ96732

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177893
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<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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neuraminidase__InfluenzaA__ACZ96752

<400> 177894
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177895
<211> 1410
<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ96762

<400> 177895

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ACZ96772

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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neuraminidase__InfluenzaA__ACZ96782

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177898
<211> 1410
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177899
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<213> Artificial Sequence

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<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ96802

<400> 177899
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177900
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96812

<400> 177900
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177901
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96822

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177902
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96842

<400> 177902
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugauc gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177903
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96852

<400> 177903
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177904
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96862

<400> 177904
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177905
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96872

<400> 177905

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177906
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177907
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96892

<400> 177907
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177908
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96902

<400> 177908
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177909
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ96912

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177910
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96922

<400> 177910
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177911
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96932

<400> 177911
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177912
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ96942

<400> 177912
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177913
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ96952

<400> 177913
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177914
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ97024

<400> 177914
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177915
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ97336

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177916
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ97346

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177917
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ97366

<400> 177917
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177918
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ97376

<400> 177918
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177919
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ97386

<400> 177919
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177920
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ97396

<400> 177920
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177921
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ98171

<400> 177921
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177922
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ98181

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177923
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ98191

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucagcuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177924
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ98201

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177926
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ98221

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177927
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ98231

<400> 177927
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177928
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ98241

<400> 177928
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177929
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ98251

<400> 177929
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa cagaaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177930
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ98261

<400> 177930
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177931
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ98271

<400> 177931
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177932
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ98281

<400> 177932
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177933
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<220>
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neuraminidase__InfluenzaA__ACZ98291

<400> 177933
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177934
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ98301

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177935
<211> 1410
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucaacag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177936
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<220>
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<400> 177936
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177937
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ98341

<400> 177937
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccaccc cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacc uggccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177938
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ98351

<400> 177938
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177939
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ98361

<400> 177939
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177940
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ98371

<400> 177940
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177941
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ98381

<400> 177941
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177942
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ACZ98391

<400> 177942
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177943
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ98401

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177944
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neuraminidase__InfluenzaA__ACZ98411

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177945
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neuraminidase__InfluenzaA__ACZ98421

<400> 177945
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177946
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ98431

<400> 177946
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177947
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<212> RNA
<213> Artificial Sequence

<220>
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<400> 177947
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177948
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ACZ98451

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177949
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<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ACZ98461

<400> 177949

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177950

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ACZ98674

<400> 177950
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177951
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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neuraminidase__InfluenzaA__ADA60801

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177955
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA69304

<400> 177955
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177956
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA69314

<400> 177956
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177957
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA69324

<400> 177957
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177958
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADA69334

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177959
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADA69451

<400> 177959

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177960
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADA69453

<400> 177960
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177961
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA71153

<400> 177961
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ugcuucuuca ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 177962
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA71155

<400> 177962
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagauc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaagg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177963
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADA71157

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177964
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA71159

<400> 177964
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagauc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaagg ugguggccgg cgagggcaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucaac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacag aaccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177965
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA71161

<400> 177965
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgacc ugaaccugau gcccaucuga 1410

<210> 177966
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA71165

<400> 177966
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucagcaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177967
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA71167

<400> 177967
augaacccca accagaagau caucaccauc ggcagcguga gccugaccau cagcaccauc 60

ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga ggcagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccugaacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 177968
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA71169

<400> 177968
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

acccccguga cccugguggg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaag accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaagggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ucaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagaau cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacaucg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac ggcgacaucg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177969
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA71171

<400> 177969
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177970
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADA71173

<400> 177970
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gccagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 177971
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA71175

<400> 177971
augaacccca accagaagau caucaccauc ggcagcauca gcaucgccau cggcaucauc 60

agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagauc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaagg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucaac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 177972
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA71177

<400> 177972
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

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accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

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neuraminidase__InfluenzaA__ADA71193

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaaggugg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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neuraminidase__InfluenzaA__ADA79589

<400> 177974
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg cagcagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aagagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177975
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<220>
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neuraminidase__InfluenzaA__ADA79599

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177976
<211> 1410
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ADA79619

<400> 177977
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gccagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177978
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADA81211

<400> 177978
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177979
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neuraminidase__InfluenzaA__ADA83035

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcagc accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177980
<211> 1410
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA83037

<400> 177980
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ggcaaccagg accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177981
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<220>
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neuraminidase__InfluenzaA__ADA83588

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 177982
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<212> RNA

<213> Artificial Sequence

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<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA83592

<400> 177982
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177983
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA83596

<400> 177983
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177984
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA83600

<400> 177984
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177985
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177986
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADA83608

<400> 177986
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177987
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADA83612

<400> 177987
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177988
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADA83616

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177990
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<220>
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neuraminidase__InfluenzaA__ADA83630

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177991
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neuraminidase__InfluenzaA__ADA83634

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 177992
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADA83638

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 177993
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADA83642

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADA83649

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 177995
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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<220>
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neuraminidase__InfluenzaA__ADA83657

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADA83661

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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neuraminidase__InfluenzaA__ADA83669

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178001
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA83681

<400> 178001
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178002
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADA83685

<400> 178002
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178003
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADA86069

<400> 178003

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178004

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB27973

<400> 178004
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178005
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB27983

<400> 178005
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178006
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADB66693

<400> 178006
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucauccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178007
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB66695

<400> 178007
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178008
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB66696

<400> 178008
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178009
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADB66697

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacgagcag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguacagaa ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucca cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaaggugg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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neuraminidase__InfluenzaA__ADB81421

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<220>
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neuraminidase__InfluenzaA__ADB81431

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<220>
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<400> 178013

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

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<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178015
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<220>
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neuraminidase__InfluenzaA__ADB81461

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178019
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADB89142

<400> 178019
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178020
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADB89224

<400> 178020
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178021
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89234

<400> 178021
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178022
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADB89244

<400> 178022
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178023
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADB89264

<400> 178023
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178024
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADB89274

<400> 178024
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcgaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178025
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADB89284

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178026
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADB89294

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178027
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADB89304

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178028
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADB89314

<400> 178028
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178029
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89324

<400> 178029
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178030
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADB89334

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178031
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89344

<400> 178031
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178032
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89364

<400> 178032
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178033
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89374

<400> 178033
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178034
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADB89384

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178035
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADB89394

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178036
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADB89404

<400> 178036
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacagcaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178037
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89414

<400> 178037
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178038
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 178038
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178039
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADB89434

<400> 178039
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178040
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89444

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178041
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89454

<400> 178041
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccaa cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178042
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89464

<400> 178042
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178043
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89484

<400> 178043
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178044
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADB89494

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178045
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADB89504

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178046
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ADB89514

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178047
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADB89524

<400> 178047
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178048
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89544

<400> 178048
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccugcu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178049
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89564

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178050
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89574

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178051
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89594

<400> 178051
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178052
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89604

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178053
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89614

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcau cuggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178054
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178055
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<220>
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neuraminidase__InfluenzaA__ADB89634

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178056
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89644

<400> 178056
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178057
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADB89664

<400> 178057

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178058

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89674

<400> 178058
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178059
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89684

<400> 178059
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178060
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADB89694

<400> 178060
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178061
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89704

<400> 178061
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178062
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89714

<400> 178062
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178063
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89724

<400> 178063
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 178064
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB89735

<400> 178064
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

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<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADB90357

<400> 178065
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178066
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADB90358

<400> 178066
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178067
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB90359

<400> 178067

augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguacagaa ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaccaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178068
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADB90363

<400> 178068
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178069
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB90373

<400> 178069
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaaguu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178070
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB98137

<400> 178070
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178071
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADB98138

<400> 178071
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178072
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB98139

<400> 178072
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178073
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB98140

<400> 178073
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178074
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADB98141

<400> 178074
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178075
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC32391

<400> 178075
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178076
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC32392

<400> 178076
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178077
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC32393

<400> 178077
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178078
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC32394

<400> 178078
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178079
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADC32395

<400> 178079
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178080
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC32396

<400> 178080
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178081
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC32397

<400> 178081
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178082
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC32398

<400> 178082
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178083
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC32399

<400> 178083
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178084
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADC32400

<400> 178084
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178085
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC32401

<400> 178085
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178086
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC32404

<400> 178086
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178087
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC32407

<400> 178087
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178088
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC34942

<400> 178088
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaacc cccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagagagug gagcaagccc cagugcaaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caucgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugcg ugaccggcga cgacaagaac 600

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 178089
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC39000

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaacgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178090
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<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADC39010

<400> 178090
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178091
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC45606

<400> 178091
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178092
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADC45628

<400> 178092
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agccugaugc ugcagauggg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

acccccguga cccuggugggg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaag accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaagggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccaaggac agagagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagaau cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac ggcgacaucg ccaacuggag cuggcccgac 1380

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<210> 178093
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<220>
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neuraminidase__InfluenzaA__ADC45639

<400> 178093
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

acccccguga cccugguggg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaag accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucggcugg cugaccaucg gcgugagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaagggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau ggagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac agagagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagaau cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178094
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<220>
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neuraminidase__InfluenzaA__ADC45650

<400> 178094
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178095
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC45661

<400> 178095
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178096
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADC45683

<400> 178096
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

acccccguga cccuggugggg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaag accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaagggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

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ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac agagagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagaau cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac ggcgacaucg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178097
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADC45705

<400> 178097
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag aacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178098
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADC45716

<400> 178098
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

acccccguga cccugguggg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaag accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaagggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau ggagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac agagagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugga gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagaau cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac ggcgacaucg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178099
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADC45738

<400> 178099
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

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<210> 178100
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADC45760

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgccaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178101
<211> 1413

<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADC45771

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178102
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC45782

<400> 178102
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacag aaccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178103
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADC45804

<400> 178103
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagauca ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178104
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC45815

<400> 178104
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccgugaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau ggugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178105
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC45837

<400> 178105
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accaacaccg acagcgacuu cagcgugaag caggacgugg uggccaucac cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178106
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC45848

<400> 178106
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178107
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADC53559

<400> 178107
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178108
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 178108
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178109
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14090

<400> 178109
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178110
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14094

<400> 178110
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178111
<211> 1410
<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD14096

<400> 178111

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178112

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD14098

<400> 178112
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178113
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14100

<400> 178113
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178114
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD14102

<400> 178114
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178115
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14104

<400> 178115
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178116
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14106

<400> 178116
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178117
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14110

<400> 178117
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178118
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14112

<400> 178118
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178119
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14114

<400> 178119
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcgaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178120
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD14116

<400> 178120
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178121
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14118

<400> 178121

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178122
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD14120

<400> 178122
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178123
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14122

<400> 178123
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178124
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14124

<400> 178124
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178125
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD14126

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugaccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178126
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14128

<400> 178126
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178127
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14130

<400> 178127
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178128
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14132

<400> 178128
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178129
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD14134

<400> 178129
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178130
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ADD14138

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178132
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14142

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178133
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<212> RNA
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neuraminidase__InfluenzaA__ADD14144

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178134
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD14146

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178135
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD14148

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADD14150

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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neuraminidase__InfluenzaA__ADD14152

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aucaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14156

<400> 178139
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178140
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14158

<400> 178140
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178141
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14164

<400> 178141
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178142
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14174

<400> 178142
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178143
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14184

<400> 178143
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178144
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14194

<400> 178144
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178145
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD14204

<400> 178145
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178146
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD21449

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agccugcugc ugcagaucgg caacaucgug agccugugga ucagccacag cauccagacc 120

ggcgagaaga accacagcga gaccugcaac agaaacacca ucaccuacga gaacagcacc 180

ugggugaacc agaccuacgu gaacaucagc aacaucaaca ucgccggcgg ccagggcgug 240

gccagcauca uccuggccgg caacagcagc cugugccccg ugaacggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgaca ucuucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacagac acagcaacgg caccgugaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacagaaucc ugagaaccca ggagagcgag ugcgugugca ucaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggccag gccagcuaca agaucuucaa gauggagaga 780

ggcaagauca ucaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acaccggcaa gguggugugc gugugcagag acaacuggca cgccagcaac 900

agacccuggg ugagcuucga ccagaaccug gacuaccaga ucggcuacau cagcagcggc 960

guguucggcg acaaccccag aagcaacgac ggcaagggca acugcggccc cgugcugagc 1020

aacggcgcca acggcgugaa gggccugagc uucagauacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaccaacag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggccag cccaagcaga gcaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cguggacagc gagaccgcca gcuggagcug gcccgacggc 1380

gccgaccugc ccuucaccau cgacaaguga 1410

<210> 178147
<211> 1413
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD21469

<400> 178147
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agccugaugc ugcagaucgg caacaucauc agcgugugggg ccagccacag cauccagacc 120

ggcagccaga accacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg caaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg agaccaucaa gagcuggaag 660

aagagaaugc ugagaaccca ggagagcgag ugcaucugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacggcgcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu uccacuacga ggagugcagc 840

ugcuaccccg acaccggcac cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccaaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgccg acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178148
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD21747

<400> 178148
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178149
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugaucaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ADD21817

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ADD21827

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

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agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178158
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<220>
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neuraminidase__InfluenzaA__ADD21867

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD21877

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178160
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD21897

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178161
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD22494

<400> 178161
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178162
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD22504

<400> 178162
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ADD22524

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178165
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acagccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178166

<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADD22544

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178167
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neuraminidase__InfluenzaA__ADD22557

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178168
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD22567

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178169
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<212> RNA
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neuraminidase__InfluenzaA__ADD22577

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178170
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD22587

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178171
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD22597

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178172
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD22617

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178173
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD22627

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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neuraminidase__InfluenzaA__ADD22637

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178175
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<212> RNA
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<400> 178175

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD22658

<400> 178176

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178177
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD22668

<400> 178177
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178178
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD22688

<400> 178178
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucugga ucgagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178179
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD22698

<400> 178179
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178180
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD22725

<400> 178180
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178181
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD22735

<400> 178181
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178182
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD22745

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178183
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADD22755

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugcaccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acagccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD22765

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgacuggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178185
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD22775

<400> 178185
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178186
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD22785

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178187
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178188
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD22805

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178189
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD22815

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178190
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD22825

<400> 178190
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178191
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD22835

<400> 178191
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178192
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178193
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD22855

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178194
<211> 1410
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178195
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD22934

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178196
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD22944

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178197
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD22954

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178198
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD22974

<400> 178198
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178199
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23075

<400> 178199
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178200
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23085

<400> 178200
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagcug 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178201
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD23095

<400> 178201
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178202
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD23105

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178203
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADD23115

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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neuraminidase__InfluenzaA__ADD23125

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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<210> 178205
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neuraminidase__InfluenzaA__ADD23135

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178206
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD23145

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178207
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<212> RNA
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neuraminidase__InfluenzaA__ADD23155

<400> 178207
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178208
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD23165

<400> 178208
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178209
<211> 1410

<212> RNA
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neuraminidase__InfluenzaA__ADD23175

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178210
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<220>
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neuraminidase__InfluenzaA__ADD23185

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178211
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neuraminidase__InfluenzaA__ADD23195

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178212
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178213
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<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23233

<400> 178213
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucggccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178214
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23243

<400> 178214
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178215
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23253

<400> 178215
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178216
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23273

<400> 178216
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc gagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178217
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23283

<400> 178217
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178218
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23293

<400> 178218
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178219
<211> 1410
<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD23303

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178220

<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD23313

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178221
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23323

<400> 178221
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugcugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178222
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23333

<400> 178222
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178223
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23358

<400> 178223
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178224
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23368

<400> 178224
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178225
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23378

<400> 178225
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178226
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23388

<400> 178226
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178227
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23398

<400> 178227
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178228
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD23408

<400> 178228
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccaggaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178229
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23438

<400> 178229

augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178230
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD23448

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178231
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD23458

<400> 178231
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178232
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<220>
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neuraminidase__InfluenzaA__ADD23468

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178233
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<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178234
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD23488

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178235
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD23498

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accacaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178236
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neuraminidase__InfluenzaA__ADD23508

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178237
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<220>
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neuraminidase__InfluenzaA__ADD23518

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ADD23997

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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neuraminidase__InfluenzaA__ADD24007

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178241
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD24025

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178243
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD24026

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178244
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD24027

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178245
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD24028

<400> 178245
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178246
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD24029

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178247
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADD24030

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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<211> 1410
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neuraminidase__InfluenzaA__ADD24031

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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neuraminidase__InfluenzaA__ADD24032

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD25231

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ADD25233

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA

<213> Artificial Sequence

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neuraminidase__InfluenzaA__ADD25235

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178253
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD25244

<400> 178253
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178254
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD25246

<400> 178254
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caccaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178255
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178256
<211> 1410
<212> RNA
<213> Artificial Sequence

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neuraminidase__InfluenzaA__ADD25250

<400> 178256
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagcagaag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccaugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178257
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD25255

<400> 178257
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178258
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD25259

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178259
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD25262

<400> 178259
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgccg acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178260
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD25266

<400> 178260
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugcccguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178261
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD25268

<400> 178261
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178262
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD25271

<400> 178262
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178263
<211> 1410

<212> RNA
<213> Artificial Sequence

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neuraminidase__InfluenzaA__ADD25274

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178264
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD25276

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178265
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD25278

<400> 178265
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagcagaag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178266
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADD25280

<400> 178266
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178267
<211> 1410
<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178268
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADD25284

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178269
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD25287

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178270
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD25291

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178271
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD25293

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178272
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD25300

<400> 178272
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178273
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD25304

<400> 178273

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178274

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD25306

<400> 178274
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagcagaag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acgagcccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcggcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178275
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD25308

<400> 178275
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178276
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD25310

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178277
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD25312

<400> 178277
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178278
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178280
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD29799

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<211> 1410
<212> RNA
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<220>
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<400> 178283

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178285
<211> 1410
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178286
<211> 1410
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178287
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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neuraminidase__InfluenzaA__ADD74373

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacg uggccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcagcggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178297
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74431

<400> 178297
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178298
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74441

<400> 178298
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178299
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74451

<400> 178299
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178300
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD74461

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178301
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74471

<400> 178301
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178302
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74481

<400> 178302
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178303
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74491

<400> 178303
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178304
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74501

<400> 178304
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178305
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD74511

<400> 178305
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178306
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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<400> 178306
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178307
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD74531

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178308
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74551

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacuac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178309
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD74561

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178310
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74571

<400> 178310
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178311
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74581

<400> 178311
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacgccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178312
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD74591

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178313
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74601

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178314
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD74611

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcaucaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178315
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<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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<210> 178316
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD74631

<400> 178316
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178317
<211> 1410

<212> RNA
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<220>
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<400> 178317
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178318
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74651

<400> 178318
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178319
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD74661

<400> 178319
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178320
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD74671

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178321
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178322
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADD74691

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178323
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ADD74711

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178325
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178326
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD74731

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178327
<211> 1410
<212> RNA
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<220>

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<400> 178327

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg cagcagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178328

<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD74751

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaacaaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug aaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178329
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74761

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg caucaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178330
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178331
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD74811

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

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<211> 1410
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178333
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD74831

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcc ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178334
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74841

<400> 178334
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178335
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74851

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178336
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD74861

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178337
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74871

<400> 178337

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178338
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD74881

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178339
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74891

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178340
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74901

<400> 178340
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178341
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD74911

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178342
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD74921

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178343
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74941

<400> 178343
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD74961

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucgg caccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc acaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178345
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD74971

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD74981

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ggcaaccaga accagaucga gaccugcaac cagagcauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccgaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD74991

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD75001

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcgaccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178351
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaagacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178352
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD75051

<400> 178352
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178353
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD75061

<400> 178353
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178354
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD75071

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178355
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD75081

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178356
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD75091

<400> 178356
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178357
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD75101

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178358
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178359
<211> 1410
<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178360
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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neuraminidase__InfluenzaA__ADD75161

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagca gcuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguacaaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacagauga 1410

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucauc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacuucagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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gccgagcugc ccuucaccau cgacaaguga 1410

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg cagcagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

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gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

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ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178380
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD96869

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccaccc cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaag 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178381
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD96879

<400> 178381

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu gggcugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178382

<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD96889

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178383
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD96899

<400> 178383
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178384
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<220>
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neuraminidase__InfluenzaA__ADD96919

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ADD96929

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178387
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178388
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178389
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD96969

<400> 178389
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178390
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagca gcuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178391
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97038

<400> 178391

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccggcg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178392
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD97048

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178393
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97058

<400> 178393
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178394
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97069

<400> 178394
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178395
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178396
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97164

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178397
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178398
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97184

<400> 178398
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178399
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<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD97194

<400> 178399
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacgccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178400
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97204

<400> 178400
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagca gcuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178401
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD97214

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178402
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97224

<400> 178402
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178403
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD97234

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178404
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD97244

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178405
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD97254

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178406
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178407
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<220>
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neuraminidase__InfluenzaA__ADD97274

<400> 178407
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178408
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucugc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178409
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178410
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<220>
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neuraminidase__InfluenzaA__ADD97314

<400> 178410
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178411
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97334

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178412
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97344

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178413
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<212> RNA
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neuraminidase__InfluenzaA__ADD97354

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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neuraminidase__InfluenzaA__ADD97384

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178415
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD97394

<400> 178415
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagcccgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugaacggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178416
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD97404

<400> 178416
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178417
<211> 1410
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<213> Artificial Sequence

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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<210> 178418
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD97434

<400> 178418
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178419
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD97444

<400> 178419
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178420
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD97454

<400> 178420
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugcccca ucagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

agcgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178421
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD97464

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178422
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neuraminidase__InfluenzaA__ADD97474

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178423
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<220>
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neuraminidase__InfluenzaA__ADD97484

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178424
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccccag cgagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178425
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<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178426
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97514

<400> 178426
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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<210> 178427
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD97534

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178428
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97544

<400> 178428
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178429
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97554

<400> 178429
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178430
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97564

<400> 178430
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacac cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178431
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178432
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<212> RNA
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<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97584

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178433
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaucaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178434
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagca gcuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178435
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD97701

<400> 178435

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucaacag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178436

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97891

<400> 178436
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178437
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97901

<400> 178437
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178438
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD97911

<400> 178438
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178439
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97921

<400> 178439
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178440
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97931

<400> 178440
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178441
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD97941

<400> 178441
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178442
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD97951

<400> 178442
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178443
<211> 1410
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<220>
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neuraminidase__InfluenzaA__ADD97961

<400> 178443
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacgccagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178444
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<220>
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neuraminidase__InfluenzaA__ADD97971

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagca gcuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178445
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD97981

<400> 178445

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178446
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD97991

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178447
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD98001

<400> 178447
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccgugaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178448
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD98011

<400> 178448
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178449
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD98031

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178450
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD98041

<400> 178450
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccgugaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178451
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD98051

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178452
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD98061

<400> 178452
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178453
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD98071

<400> 178453
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178454
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD98081

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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neuraminidase__InfluenzaA__ADD98091

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178456
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADD98101

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccaacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178457
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD98111

<400> 178457
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

auccugggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178458
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD98121

<400> 178458
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178459
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD98131

<400> 178459
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178460
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178461
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD98151

<400> 178461
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178462
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADD98161

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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<210> 178463
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADD98171

<400> 178463
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagaccgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag aagcaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178464
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD98181

<400> 178464
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aaccugaucc ugcagaucgg caacaugauc agcaucugga ucagccacag cauccagcug 120

gagaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178465
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADD98201

<400> 178465
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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<210> 178467
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADE20324

<400> 178467
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178468
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<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADE20334

<400> 178468
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

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<210> 178469
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178470
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<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

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agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178471
<211> 1410
<212> RNA
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<400> 178471
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178472
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 178472
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178473
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADE20631

<400> 178473
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178474
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20641

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggugggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178475
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADE20651

<400> 178475
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178476
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADE20661

<400> 178476
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178477
<211> 1410
<212> RNA
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<400> 178477
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178478
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADE20681

<400> 178478
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

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ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178479
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<212> RNA
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neuraminidase__InfluenzaA__ADE20701

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc gugaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178480
<211> 1410
<212> RNA
<213> Artificial Sequence

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neuraminidase__InfluenzaA__ADE20711

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178481
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacagauga 1410

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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20731

<400> 178482
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc gugaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178483
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20741

<400> 178483
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178484
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20751

<400> 178484
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178485
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20761

<400> 178485
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc gugaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178486
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADE20781

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc gugaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<220>
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neuraminidase__InfluenzaA__ADE20791

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178488
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADE20801

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178489
<211> 1410
<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADE20811

<400> 178489

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178490

<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20821

<400> 178490
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178491
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20831

<400> 178491
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178492
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20841

<400> 178492
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178493
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20851

<400> 178493
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178494
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADE20861

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacac cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178495
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20871

<400> 178495
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178496
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADE20881

<400> 178496
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ADE20891

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178498
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<212> RNA
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neuraminidase__InfluenzaA__ADE20901

<400> 178498
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178499
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neuraminidase__InfluenzaA__ADE20911

<400> 178499

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178500
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADE20921

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178501
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20931

<400> 178501
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugcugagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucggcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178502
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20941

<400> 178502
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178503
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADE20951

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacgugg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178504
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20961

<400> 178504
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacgac aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178505
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20971

<400> 178505
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178506
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20981

<400> 178506
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacac cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178507
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE20991

<400> 178507
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178508
<211> 1410
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neuraminidase__InfluenzaA__ADE21001

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucaucau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178509
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178510
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178511
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE21031

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccgugaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178512
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE21041

<400> 178512
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcau cgagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178513
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<220>
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neuraminidase__InfluenzaA__ADE21051

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178514
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADE21071

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugaacggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178515
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<212> RNA
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<220>
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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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<210> 178516
<211> 1413
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<220>
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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178517
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADE28773

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178518
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADE28783

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcugguggg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178519
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADE28803

<400> 178519
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc gugaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178520
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADE28813

<400> 178520
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178521
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<212> RNA
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neuraminidase__InfluenzaA__ADE28823

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178522
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<212> RNA

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccgugg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178523
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<220>
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neuraminidase__InfluenzaA__ADE28853

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178524
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccgugg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178525
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cgugcagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178526
<211> 1410
<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178527
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<220>
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neuraminidase__InfluenzaA__ADE28914

<400> 178527
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178528
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADE28924

<400> 178528
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178529
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE28934

<400> 178529
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugca ucaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178530
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE28954

<400> 178530
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178531
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE28964

<400> 178531
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaucaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178532
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ADE28974

<400> 178532
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178533
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADE29004

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguacagaa ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178534
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADE29014

<400> 178534
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178535
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADE29024

<400> 178535
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaag 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178536
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE29034

<400> 178536
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178537
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE29044

<400> 178537
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178538
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADE29054

<400> 178538
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178539
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE29064

<400> 178539
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178540
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADE29087

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaag accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178541
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE29097

<400> 178541
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178542
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADE34194

<400> 178542
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 178543
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADE34205

<400> 178543

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aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 178544

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE34216

<400> 178544
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ugcuucuuca ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 178545
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE34227

<400> 178545
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

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aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 178546
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE34238

<400> 178546
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug cagcgacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 178547
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE34260

<400> 178547
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gagcaucuga 1410

<210> 178548
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE34271

<400> 178548
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

uaccccagau accccggcgu gagaugcgug ugcagagaca acuggaaggg cagcaacaga 900

cccaucgugg acaucaacau caaggaccac agcaucguga gcagcuacgu gugcagcggc 960

cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug cagcgacccc 1020

aacaacgagg agggcggcca cggcgugaag ggcugggccu ucgacgacgg caacgacgug 1080

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gagggcugga gcaaccccaa gagcaagcug cagaucaaca gacaggugau cguggacaga 1200

ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 178549
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE45502

<400> 178549
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178550
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE45504

<400> 178550
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178551
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE45506

<400> 178551
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178552
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADE45508

<400> 178552
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178553
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE45510

<400> 178553

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178554
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADE45512

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178555
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE45514

<400> 178555
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uuccaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178556
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADE45516

<400> 178556
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagccu gagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178557
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADF10069

<400> 178557
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cacccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178558
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10079

<400> 178558
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178559
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF10089

<400> 178559
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178560
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10099

<400> 178560
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178561
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADF10109

<400> 178561
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca acugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178562
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10129

<400> 178562
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178563
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10146

<400> 178563
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccaggaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178564
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10166

<400> 178564
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178565
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10176

<400> 178565
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178566
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10192

<400> 178566
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178567
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10247

<400> 178567
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178568
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10290

<400> 178568
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178569
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10304

<400> 178569
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccggccugc ccuucaccau cgacaaguga 1410

<210> 178570
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10340

<400> 178570
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178571
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10361

<400> 178571
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178572
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10371

<400> 178572
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178573
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF10407

<400> 178573
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178574
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<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178575
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF10616

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178576
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF10688

<400> 178576
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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<210> 178577
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<212> RNA
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<400> 178577
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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<210> 178578
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF10773

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178579
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neuraminidase__InfluenzaA__ADF10837

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaag 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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<210> 178580
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADF10889

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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<210> 178581
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<212> RNA
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<223> derived and/or modified CDS sequence (opt4) from
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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<210> 178582
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178583
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF27355

<400> 178583
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaugggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178584
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF27356

<400> 178584
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagaacguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178585
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27357

<400> 178585
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178586
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ADF27358

<400> 178586
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178587
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27360

<400> 178587
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178588
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27361

<400> 178588
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178589
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF27362

<400> 178589
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178590
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<220>
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neuraminidase__InfluenzaA__ADF27363

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178591
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADF27364

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178592
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27365

<400> 178592
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178593
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27366

<400> 178593
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178594
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27382

<400> 178594
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178595
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27392

<400> 178595
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178596
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27402

<400> 178596
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178597
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADF27422

<400> 178597

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaag 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178598

<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF27432

<400> 178598
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178599
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27442

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gagaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178600
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27462

<400> 178600
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ggcaaccaga accagaucga ggccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccguguac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178601
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF27472

<400> 178601
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178602
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27482

<400> 178602
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accaggugga gaccugcaac cagagcauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178603
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27492

<400> 178603
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gcccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcau cgagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccgugug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178604
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27502

<400> 178604
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178605
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27512

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178606
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27522

<400> 178606
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaucaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178607
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27532

<400> 178607

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178608
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguacagaa ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178609
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27552

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aaccugaucc ugcagaucgg caacaucauc agcaucuggg ugagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguacagaa ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178610
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27562

<400> 178610
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccaacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178611
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178612
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF27582

<400> 178612
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguacagaa ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178613
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27592

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178614
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27602

<400> 178614
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaga 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178615
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27612

<400> 178615
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178616
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27622

<400> 178616
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178617
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF27632

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178618
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27642

<400> 178618
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178619
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF27652

<400> 178619
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178620
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27662

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gcaacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguacagaa ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178621
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27672

<400> 178621
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178622
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF27682

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178623
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27692

<400> 178623
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178624
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178625
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<220>
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neuraminidase__InfluenzaA__ADF27712

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178626
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27788

<400> 178626
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178627
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27798

<400> 178627
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccaa cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178628
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27808

<400> 178628
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguacagaa ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178629
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF27818

<400> 178629
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucaacag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178630
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF27838

<400> 178630
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178631
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF27848

<400> 178631
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178632
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF27858

<400> 178632
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

agcagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacggc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178633
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF27878

<400> 178633
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178634
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<220>
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neuraminidase__InfluenzaA__ADF27888

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178635
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<220>
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<400> 178635
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178636
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<212> RNA
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neuraminidase__InfluenzaA__ADF27908

<400> 178636
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178637
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neuraminidase__InfluenzaA__ADF27918

<400> 178637
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178638
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF27938

<400> 178638
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauga gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178639
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF27948

<400> 178639
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178640
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF27958

<400> 178640
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178641
<211> 1410

<212> RNA
<213> Artificial Sequence

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neuraminidase__InfluenzaA__ADF27968

<400> 178641
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178642
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF27978

<400> 178642
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178643
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucagcuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguacagaa ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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neuraminidase__InfluenzaA__ADF27998

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ADF28018

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

aucaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ADF28028

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178648
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF28038

<400> 178648
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccaccgg ccagcuggug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacagac acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178649
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF28048

<400> 178649
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178650
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF28058

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178651
<211> 1410
<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADF28068

<400> 178651

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg cagcagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178652

<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF28078

<400> 178652
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<220>
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neuraminidase__InfluenzaA__ADF28088

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugcccguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

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<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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<210> 178661
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<220>
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<400> 178661

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

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agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178666
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADF58352

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178667
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF80459

<400> 178667
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugaccuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccgugug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178668
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF80503

<400> 178668
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aaccugaucc ugcagaucgg caacaucacc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178669
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF83744

<400> 178669
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaag 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 178670
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF83755

<400> 178670
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ugcuucuuca ugcagaccgc cauccugauc accaccguga cccugcacuu caagcagugc 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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cugguggggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 178671
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF83766

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaccga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg acaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178672
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF83776

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178673
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF83786

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178674
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF83796

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugagaaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178675
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF83806

<400> 178675
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178676
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADF83816

<400> 178676
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacgccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178677
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF83826

<400> 178677
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178678
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADF83836

<400> 178678
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178679
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF83846

<400> 178679
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178680
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF83856

<400> 178680
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178681
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF83866

<400> 178681
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178682
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF83876

<400> 178682
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaag 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178683
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADF83888

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178686
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<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccga gcagagcgug 240

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agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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neuraminidase__InfluenzaA__ADF87155

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF87165

<400> 178694
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgacaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cgccaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccga gcagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178696
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF87185

<400> 178696
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<212> RNA
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neuraminidase__InfluenzaA__ADF87195

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccga gcagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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neuraminidase__InfluenzaA__ADF87215

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

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agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF87235

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178701
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF87245

<400> 178701
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccga gcagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178702
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF87265

<400> 178702
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccga gcagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178703
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF87285

<400> 178703
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaacaaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178704
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF87295

<400> 178704
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178705
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADF87305

<400> 178705

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178706

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF87334

<400> 178706
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178707
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF87344

<400> 178707
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178708
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF87354

<400> 178708
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178709
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF87364

<400> 178709
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178710
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADF87374

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178711
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF87384

<400> 178711
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ggcaaccaga accagaucga gaccugcaac cagagcauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178712
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF97251

<400> 178712
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178713
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF97252

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccaa cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178714
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178715
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADF97254

<400> 178715

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178716
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADF97255

<400> 178716
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178717
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF97256

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178718
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADF97257

<400> 178718
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178719
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADF97837

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178720
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADG08120

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178721
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neuraminidase__InfluenzaA__ADG21408

<400> 178721
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caaccugagc cugugccccg ugagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 178722
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<220>
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

ggcaaggugg ugaagagcgu ggagcuggac gcccccaacu accacuacga ggagugcagc 780

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 178723
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADG21415

<400> 178723
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

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<211> 1350
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neuraminidase__InfluenzaA__ADG21417

<400> 178724
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 178725
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG21419

<400> 178725
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gagcaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 178726
<211> 1350
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG21423

<400> 178726
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 178727
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neuraminidase__InfluenzaA__ADG21424

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gagcaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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<210> 178728
<211> 1350
<212> RNA
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neuraminidase__InfluenzaA__ADG21426

<400> 178728
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

gagaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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<210> 178729
<211> 1350
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG21428

<400> 178729

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ggcaaccagu gccaggacaa gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

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ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

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<210> 178730
<211> 1350
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neuraminidase__InfluenzaA__ADG21430

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ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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<220>
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neuraminidase__InfluenzaA__ADG21432

<400> 178731
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ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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guguucggcg acaaccccag acccaacgac ggcaccggca gcugcggccc cguguucccc 960

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<210> 178732

<211> 1350
<212> RNA
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agccugaugc ugcagaucgg caacaugauc agcaucugga ucagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG21440

<400> 178733
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ggcaaccagu gccaggacga gagcaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

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<220>
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neuraminidase__InfluenzaA__ADG21442

<400> 178734
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 178735
<211> 1350
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<220>
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neuraminidase__InfluenzaA__ADG21444

<400> 178735
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gagcaucagc aacaccaagu uccugaccga gaaggccgug 180

accagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga gcaccaucug gaccagcggc 1260

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 178736
<211> 1350
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG21446

<400> 178736
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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 600

aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

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<211> 1350
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG21448

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

ugccccgugg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 480

gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

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aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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gccgagcugc ccuucaccau cgacaaguga 1350

<210> 178738
<211> 1350
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG21450

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agccugaugc ugcagaucgg caacaugauc agcaucuggg ugagccacag cauccagacc 120

ggcaaccagu gccaggacga gcccaucagc aacaccaagu uccugaccga gaaggccgug 180

gccagcguga cccuggccgg caacagcagc cugugcccca ucagcggcug ggccguguac 240

agcaaggaca acagcaucag aaucggcagc agaggcgacg uguucgugau cagagagccc 300

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 360

aacgacaagc acagcaacgg caccgugaag gacagaagcc cccacagaac ccugaugagc 420

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gccagcgccu gccacgacgg caccagcugg cugaccaucg gcaucagcgg ccccgacaac 540

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aacaacauca ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 660

gugaugaccg acggccccag cagcggccag gccagcuaca agaucuucaa gauggagaag 720

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<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADG27797

<400> 178739
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

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aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178740
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG27983

<400> 178740
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacc accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccaugg gcuggagcug gcccgacggc 1380

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<210> 178741
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 178741
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178742
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG27998

<400> 178742
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacc accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccaugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178743
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG28013

<400> 178743
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178744
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42086

<400> 178744
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178745
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42096

<400> 178745
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178746
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42106

<400> 178746
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg cagcagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178747
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42116

<400> 178747
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178748
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG42126

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178749
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADG42136

<400> 178749
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178750
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 178750
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178751
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42156

<400> 178751
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178752
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42166

<400> 178752
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178753
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42186

<400> 178753
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178754
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42196

<400> 178754
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccga gcagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178755
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<212> RNA
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neuraminidase__InfluenzaA__ADG42206

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcaa gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178756
<211> 1410
<212> RNA

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<220>
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neuraminidase__InfluenzaA__ADG42216

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

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<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42226

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178758
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42236

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178759
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178760
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178761
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42276

<400> 178761
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178762
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42296

<400> 178762
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagagccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178763
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42306

<400> 178763
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178764
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178765
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<212> RNA
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neuraminidase__InfluenzaA__ADG42326

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178766
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<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178767
<211> 1410

<212> RNA
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neuraminidase__InfluenzaA__ADG42346

<400> 178767
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugcccguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178768
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<212> RNA
<213> Artificial Sequence

<220>
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<400> 178768
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178769
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADG42366

<400> 178769
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccugga ucagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178770
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42376

<400> 178770
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178771
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42386

<400> 178771
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga aguucgccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccaa cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaagcggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178772
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42396

<400> 178772
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcaa gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178773
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42406

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aaccugaucc ugcagaucgg caacauccug agcaccugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178774
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178775
<211> 1410
<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178776
<211> 1410
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcgcca agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178777
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG42456

<400> 178777

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc cccacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178778

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42466

<400> 178778
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178779
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42476

<400> 178779
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaccga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178780
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG42486

<400> 178780
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucaa gaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178781
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG42496

<400> 178781
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178782
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42506

<400> 178782
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaaggugg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178783
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG42516

<400> 178783
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaaggugg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178784
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42526

<400> 178784
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcc ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178785
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42536

<400> 178785
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaccagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178786
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 178786
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178787
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADG42556

<400> 178787

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178788
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG42566

<400> 178788
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccacagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178789
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42576

<400> 178789
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccuacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucaa gaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178790
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42586

<400> 178790
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178791
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuuccccau cgacaaguga 1410

<210> 178792
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42616

<400> 178792
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178793
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42626

<400> 178793
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178794
<211> 1410
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaccga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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neuraminidase__InfluenzaA__ADG42646

<400> 178795
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178796
<211> 1410
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<220>
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<400> 178796
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178797
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42666

<400> 178797
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcauca ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178798
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42676

<400> 178798
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ggcaaccaga accagaucga gaucugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178799
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42686

<400> 178799
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178800
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<212> RNA
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neuraminidase__InfluenzaA__ADG42696

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg cagcagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178801
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42706

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaag 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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neuraminidase__InfluenzaA__ADG42716

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178803
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42726

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178804
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178805
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42756

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacgccgugg gcuggagcug gcccgacggc 1380

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<210> 178806
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42766

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178807
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42776

<400> 178807
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178808
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<212> RNA
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neuraminidase__InfluenzaA__ADG42796

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178809
<211> 1410
<212> RNA
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccguga gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178810
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<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADG42816

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178811
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG42826

<400> 178811
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178812
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42836

<400> 178812
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178813
<211> 1410
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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<210> 178814
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<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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<210> 178815
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<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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<210> 178816
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42876

<400> 178816
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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<210> 178817
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG42886

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccgugaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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<210> 178818
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<212> RNA
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<400> 178818
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagca gcuacagaac ccugaugagc 480

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ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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<210> 178819
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<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagca gcuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178820
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<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

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<210> 178821
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<212> RNA
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

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<210> 178822
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ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178823
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<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178824
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADG58913

<400> 178824
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugaccuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucugga ucgagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178825
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58914

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178826
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58916

<400> 178826
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178827
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58917

<400> 178827
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178828
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58918

<400> 178828
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugaccuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178829
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG58919

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugaccuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucugga ucgagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178830
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG58920

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178831
<211> 1410
<212> RNA
<213> Artificial Sequence

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<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG58921

<400> 178831

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178832

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58922

<400> 178832
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178833
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58923

<400> 178833
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178834
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG58924

<400> 178834
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178835
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58925

<400> 178835
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178836
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58926

<400> 178836
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178837
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG58927

<400> 178837
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178838
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58928

<400> 178838
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178839
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58929

<400> 178839
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccugaacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178840
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG58931

<400> 178840
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aaccugaucc ugcagaucgg caacaccauc agcaucugga ucaaccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178841
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58932

<400> 178841

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aaccugaucc ugcagaucgg caacaccauc agcaucugga ucaaccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178842
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG58933

<400> 178842
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aaccugaucc ugcagaucgg caacaccauc agcaucugga ucaaccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178843
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58934

<400> 178843
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aaccugaucc ugcagaucgg caacaccauc agcaucugga ucaaccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178844
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58935

<400> 178844
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aaccugaucc ugcagaucgg caacaccauc agcaucugga ucaaccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178845
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG58936

<400> 178845
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aaccugaucc ugcagaucgg caacaccauc agcaucugga ucaaccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178846
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58937

<400> 178846
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aaccugaucc ugcagaucgg caacaccauc agcaucugga ucaaccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178847
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG58938

<400> 178847
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aaccugaucc ugcagaucgg caacaccauc agcaucugga ucaaccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178848
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG59589

<400> 178848
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccaugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaaggugg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178849
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG59590

<400> 178849
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178850
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG59591

<400> 178850
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178851
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG59592

<400> 178851
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178852
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG59593

<400> 178852
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucaa gaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178853
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG59594

<400> 178853
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaaguu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178854
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG59595

<400> 178854
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178855
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG59596

<400> 178855
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac agaaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178856
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG59597

<400> 178856
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178857
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG59598

<400> 178857
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178858
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADG59599

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaaggugg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178859
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADG59601

<400> 178859
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178860
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG59602

<400> 178860
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucaa gaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178861
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG59603

<400> 178861
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucaa gaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178862
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADG59604

<400> 178862
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178863
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADG59605

<400> 178863
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178864
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADG59606

<400> 178864
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG59607

<400> 178865
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178866
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<220>
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neuraminidase__InfluenzaA__ADG59608

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178867
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacc uggccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178868
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG59610

<400> 178868
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178869
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<212> RNA
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<400> 178869
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178870
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADG59612

<400> 178870
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178871
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADG59613

<400> 178871
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aaccugaucc ugcagcuggg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccgugug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178872
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADG59614

<400> 178872
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaaggugg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178873
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADH01811

<400> 178873
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178874
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ADH01821

<400> 178874
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178875
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADH01831

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178876
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADH01841

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178877
<211> 1410
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178878
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADH01861

<400> 178878
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178879
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<212> RNA
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neuraminidase__InfluenzaA__ADH01871

<400> 178879
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178880
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADH01881

<400> 178880
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178881
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADH01891

<400> 178881
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178882
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADH01901

<400> 178882
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178883
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADH01911

<400> 178883
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178884
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADH01921

<400> 178884
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178885
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADH01931

<400> 178885

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

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ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178886

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADH01941

<400> 178886
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccga gcagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178887
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADH01951

<400> 178887
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178888
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADH01961

<400> 178888
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178889
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADH01981

<400> 178889
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaccga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178890
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADH01991

<400> 178890
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178891
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADH02011

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcaa gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178892
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADH02021

<400> 178892
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178893
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI24510

<400> 178893
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178894
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI24516

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178895
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI24518

<400> 178895

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178896
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI24522

<400> 178896
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178897
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178898
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADI24526

<400> 178898
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178899
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI24528

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178900
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI24530

<400> 178900
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178901
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI24532

<400> 178901
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178902
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI24538

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178903
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<220>
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neuraminidase__InfluenzaA__ADI24548

<400> 178903
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178904
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI24556

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<212> RNA
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neuraminidase__InfluenzaA__ADI24558

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178906
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI24560

<400> 178906
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178907
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI24562

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178908
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI24564

<400> 178908
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178909
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI24566

<400> 178909
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178910
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI24568

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178911
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI24570

<400> 178911
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178912
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI24572

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178913
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI24574

<400> 178913
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178914
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI24576

<400> 178914
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178915
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<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178916
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADI24582

<400> 178916
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaaggugg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178917
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI24584

<400> 178917
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugcccguga agcuggccgg caacagcagc cugugccccg ugaacggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178918
<211> 1410
<212> RNA

<213> Artificial Sequence

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neuraminidase__InfluenzaA__ADI24592

<400> 178918
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178919
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<212> RNA
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neuraminidase__InfluenzaA__ADI24598

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178920
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI24604

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178921
<211> 1410
<212> RNA
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178922
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neuraminidase__InfluenzaA__ADI24622

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178923
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<220>
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neuraminidase__InfluenzaA__ADI46780

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu acuacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178924
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<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADI46789

<400> 178924
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aaccugaugc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacgagcag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178925
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48185

<400> 178925
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178926
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI48187

<400> 178926
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178927
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48189

<400> 178927
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178928
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ADI48191

<400> 178928
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178929
<211> 1410

<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48193

<400> 178929
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178930
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48195

<400> 178930
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178931
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 178931
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccaguuc 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178932
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48199

<400> 178932
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178933
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48201

<400> 178933
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178934
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48203

<400> 178934
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178935
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADI48205

<400> 178935
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178936
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI48207

<400> 178936
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178937
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48209

<400> 178937
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178938
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48211

<400> 178938
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178939
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI48213

<400> 178939

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178940

<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48215

<400> 178940
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178941
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48217

<400> 178941
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178942
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI48219

<400> 178942
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178943
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48221

<400> 178943
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178944
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48625

<400> 178944
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178945
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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<400> 178945
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178946
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48655

<400> 178946
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178947
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI48665

<400> 178947
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178948
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI48675

<400> 178948
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cugaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178949
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48685

<400> 178949

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcgc cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178950
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI48695

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178951
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI48705

<400> 178951
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178952
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48715

<400> 178952
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178953
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI48725

<400> 178953
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178954
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48735

<400> 178954
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178955
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI48745

<400> 178955
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178956
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI48755

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucagcg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178957
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48765

<400> 178957
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178958
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI48775

<400> 178958
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178959
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI48785

<400> 178959
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178960
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI48795

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178961
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI49032

<400> 178961
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178962
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49243

<400> 178962
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178963
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49263

<400> 178963
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178964
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI49273

<400> 178964
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178965
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49283

<400> 178965
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178966
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI49315

<400> 178966
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178967
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49325

<400> 178967
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178968
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49335

<400> 178968
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178969
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49345

<400> 178969
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacc uggccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgacgugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178970
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI49355

<400> 178970
augaacccca accagaagau caucaccauc ggcagcgugu gcaugaccau cggcauggcc 60

aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178971
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49365

<400> 178971
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178972
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49375

<400> 178972
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178973
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49385

<400> 178973
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178974
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49395

<400> 178974
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aaccugaucc ugcagaucgg caacaugauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagcugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178975
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI49720

<400> 178975
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178976
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49730

<400> 178976
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178977
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49740

<400> 178977
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178978
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49750

<400> 178978
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178979
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49760

<400> 178979
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178980
<211> 1410
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<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADI49780

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugggcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

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<210> 178981
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI49790

<400> 178981
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178982
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from

neuraminidase__InfluenzaA__ADI49821

<400> 178982
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178983
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI50029

<400> 178983
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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<210> 178984
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI52830

<400> 178984
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

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gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gacgagcugc ccuucaccau cgacaaguga 1410

<210> 178985
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

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<210> 178986
<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI52832

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

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ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

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agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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<210> 178987
<211> 1410
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<220>
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neuraminidase__InfluenzaA__ADI52833

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

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agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggcccc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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<210> 178988
<211> 1413
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI75821

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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

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accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

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aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

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gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178989
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADI75832

<400> 178989
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

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aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgacc ugaaccugau gcccaucuga 1410

<210> 178990
<211> 1413
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI75854

<400> 178990
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agccugaugc ugcagaucgg cagcaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

ugcuaccccg acaccggcau cgugaugugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

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ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

<210> 178991
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<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI75876

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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggaggu gugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cccaucgugg acaucaacau caaggaccac agcgugguga gcagcuacgu gugcagcggc 960

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgacc ugaaccugau gcccaucuga 1410

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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI75887

<400> 178992
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgacc ugaaccugau gcccaucuga 1410

<210> 178993
<211> 1413
<212> RNA
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<220>

<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI75909

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ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

ggcaagguga ccaagagcau cgagcugaac gcccccaacu ucuacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

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agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

ggcagcagca ucagcuucug cggcgugaac agcgacaccg ccaacuggag cuggcccgac 1380

ggcgccgagc ugcccuucac caucgacaag uga 1413

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<211> 1410
<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI75920

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ugcuucuuca ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

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<220>
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neuraminidase__InfluenzaA__ADI77352

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agccugaugc ugcagaucgg caacaucauc agcaucuggg ccagccacag cauccagacc 120

ggcagccaga acaacaccgg caucugcaac cagagaauca ucaccuacga gaacagcacc 180

ugggugaacc acaccuacgu gaacaucaac aacaccaacg ugguggccgg cgaggacaag 240

accagcguga cccuggccgg caacagcagc cugugcagca ucagcggcug ggccaucuac 300

accaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagccaccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccgugaag gacagaagcc ccuacagagc ccugaugagc 480

ugcccccugg gcgaggcccc cagccccuac aacagcaagu ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caugggcugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg gcaccaucaa gagcuggaag 660

aagcagaucc ugagaaccca ggagagcgag ugcgugugca ugaacggcag cugcuucacc 720

aucaugaccg acggccccag caacaaggcc gccagcuaca agaucuucaa gaucgagaag 780

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agacccuggg ugagcuucaa ccagaaccug gacuaccaga ucggcuacau cugcagcggc 960

guguucggcg acaaccccag acccgaggac ggcgagggca gcugcaaccc cgugaccgug 1020

gacggcgcca acggcgugaa gggcuucagc uacaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaacagacu gagaaagggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcuggu gagaggccug cccagagaga acaccaccau cuggaccagc 1320

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ggcgccgagc ugcccuucac caucgacaag uga 1413

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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI77363

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

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agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaaguu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178998
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neuraminidase__InfluenzaA__ADI99553

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gacagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 178999
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<212> RNA
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<220>
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neuraminidase__InfluenzaA__ADI99563

<400> 178999
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggaggugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179000
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI99573

<400> 179000
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggaggugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179001
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI99583

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggaggugaac gccccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179002
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI99593

<400> 179002
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179003
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI99613

<400> 179003

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcaucauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179004
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcauga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcaacga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179005
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI99633

<400> 179005
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaagggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179006
<211> 1410
<212> RNA
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neuraminidase__InfluenzaA__ADI99643

<400> 179006
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179007
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI99653

<400> 179007
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179008
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI99663

<400> 179008
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179009
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI99673

<400> 179009
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179010
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADI99683

<400> 179010
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179011
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI99703

<400> 179011
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugcccguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179012
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI99713

<400> 179012
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179013
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI99723

<400> 179013
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179014
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADI99733

<400> 179014
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179015
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADJ00487

<400> 179015
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179016
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADJ00488

<400> 179016
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179017
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADJ00489

<400> 179017
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179018
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADJ00490

<400> 179018
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179019
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADJ00491

<400> 179019
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179020
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADJ18160

<400> 179020
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179021
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADJ18161

<400> 179021
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179022
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADJ18162

<400> 179022
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagaaagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179023
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADJ18164

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugcagcg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179024
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADJ18166

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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179025
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADJ18168

<400> 179025
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179026
<211> 1410
<212> RNA

<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADJ18170

<400> 179026
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179027
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADJ18172

<400> 179027
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aaccugaucc ugagaaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agaaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179028
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADJ18174

<400> 179028
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179029
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from neuraminidase__InfluenzaA__ADJ18176

<400> 179029
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccugag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179030
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADJ37250

<400> 179030
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ugcuucuuca ugcagaucgc cauccugauc accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacga caccgugaga gacagaaccc ccuacagaac ccugcugaug 480

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gccaccgcca gcuucaucua caacggcaga cugguggaca gcaucgugag cuggagcaag 660

gagauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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cugugggcg acacccccag aaagaacgac agcagcagca gcagccacug ccuggacccc 1020

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccgaca ucaaccugau gcccaucuga 1410

<210> 179031
<211> 1410
<212> RNA
<213> Artificial Sequence

<220>
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neuraminidase__InfluenzaA__ADJ37252

<400> 179031
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ugcuucuuca ugcagaucgc cauccuggug accaccguga cccugcacuu caagcaguac 120

gaguucaaca gcccccccaa caaccaggug augcugugcg agcccaccau caucgagaga 180

aacaucaccg agaucgugua ccugaccaac accaccaucg agaaggagau cugccccaag 240

cuggccgagu acagaaacug gagcaagccc cagugcgaca ucaccggcuu cgcccccuuc 300

agcaaggaca acagcaucag acugagcgcc ggcggcgaca ucugggugac cagagagccc 360

uacgugagcu gcgaccccga caagugcuac caguucgccc ugggccaggg caccacccug 420

aacaacgugc acagcaacaa caucgugaga gacagaaccc ccuacagaac ccugcugaug 480

aacgagcugg gcgugcccuu ccaccugggc accaagcagg ugugcaucgc cuggagcagc 540

agcagcugcc acgacggcaa ggccuggcug cacgugugca ucaccggcga cgacaagaac 600

gccaccgcca gcuucaucua caacggcaga cugguggaca gcguggugag cuggagcaag 660

gacauccuga gaacccagga gagcgagugc gugugcauca acggcaccug caccguggug 720

augaccgacg gcagcgccag cggcaaggcc gacaccaaga uccuguucau cgaggagggc 780

aagaucgugc acaccagcac ccugagcggc agcgcccagc acguggagga gugcagcugc 840

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uggaugggca gaaccaucag cgagaagagc agacugggcu acgagaccuu caaggugauc 1140

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ggcaacagaa gcggcuacag cggcaucuuc agcguggagg gcaagagcug caucaacaga 1260

ugcuucuacg uggagcugau cagaggcaga aaggaggaga ccgaggugcu guggaccagc 1320

aacagcaucg ugguguucug cggcaccagc ggcaccuacg gcaccggcag cuggcccgac 1380

ggcgccaaca ucaaccugau gcccaucuga 1410

<210> 179032
<211> 1410
<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADJ37263

<400> 179032
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

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ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179033
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<212> RNA
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<220>
<223> derived and/or modified CDS sequence (opt4) from
neuraminidase__InfluenzaA__ADJ37273

<400> 179033
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aaccugaucc ugcagaucgg caacaucauc agcaucugga ucagccacag cauccagcug 120

ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcgugag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag caacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

aacggcgcca acggcgugaa gggcuucagc uucaaguacg gcaacggcgu guggaucggc 1080

agaaccaaga gcaucagcag cagaaacggc uucgagauga ucugggaccc caacggcugg 1140

accggcaccg acaacaacuu cagcaucaag caggacaucg ugggcaucaa cgaguggagc 1200

ggcuacagcg gcagcuucgu gcagcacccc gagcugaccg gccuggacug caucagaccc 1260

ugcuucuggg uggagcugau cagaggcaga cccaaggaga acaccaucug gaccagcggc 1320

agcagcauca gcuucugcgg cgugaacagc gacaccgugg gcuggagcug gcccgacggc 1380

gccgagcugc ccuucaccau cgacaaguga 1410

<210> 179034
<211> 1410
<212> RNA
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<220>
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ggcaaccaga accagaucga gaccugcaac cagagcguga ucaccuacga gaacaacacc 180

ugggugaacc agaccuacgu gaacaucagc aacaccaacu ucgccgccgg ccagagcgug 240

gugagcguga agcuggccgg caacagcagc cugugccccg ugagcggcug ggccaucuac 300

agcaaggaca acagcaucag aaucggcagc aagggcgacg uguucgugau cagagagccc 360

uucaucagcu gcagcccccu ggagugcaga accuucuucc ugacccaggg cgcccugcug 420

aacgacaagc acagcaacgg caccaucaag gacagaagcc ccuacagaac ccugaugagc 480

ugccccaucg gcgaggugcc cagccccuac aacagcagau ucgagagcgu ggccuggagc 540

gccagcgccu gccacgacgg caucaacugg cugaccaucg gcaucagcgg ccccgacaac 600

ggcgccgugg ccgugcugaa guacaacggc aucaucaccg acaccaucaa gagcuggaga 660

aacaacaucc ugagaaccca ggagagcgag ugcgccugcg ugaacggcag cugcuucacc 720

gugaugaccg acggccccag cgacggccag gccagcuaca agaucuucag aaucgagaag 780

ggcaagaucg ugaagagcgu ggagaugaac gcccccaacu accacuacga ggagugcagc 840

ugcuaccccg acagcagcga gaucaccugc gugugcagag acaacuggca cggcagcaac 900

agacccuggg ugagcuucaa ccagaaccug gaguaccaga ucggcuacau cugcagcggc 960

aucuucggcg acaaccccag acccaacgac aagaccggca gcugcggccc cgugagcagc 1020

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